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APPLE CORE™**
presents

Apple Orchard™

VOLUME 2 NUMBER 4

WINTER 1981/82

\$3.50

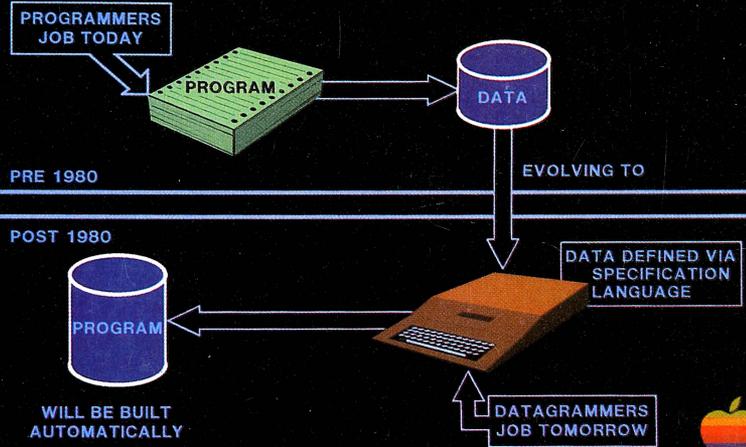
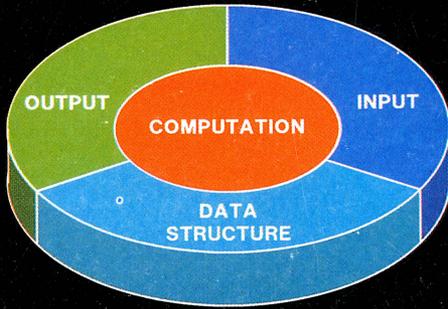
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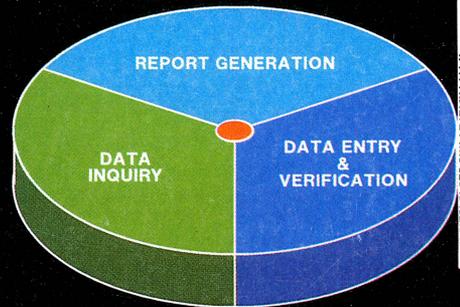
A = B * C / E
FOR I = 1 TO 10
SOURCE



SEQUENCE OF INSTRUCTIONS OPERATED ON BY MACHINE

LOAD Q + 1
MPYM Q + 2
DIVM Q + 3
STOR Q + 4

- WELL DEFINED OPERATIONS
ADD, SUB, MPY, DIV, CMP . . .
- WELL DEFINED DATA TYPES
INTEGER, REAL . . .

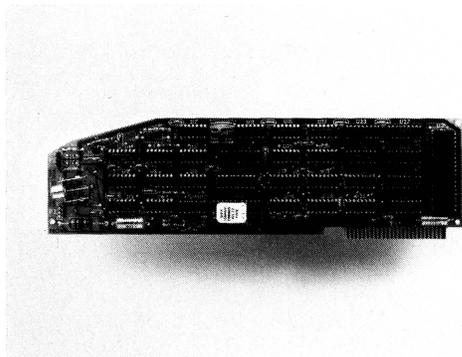
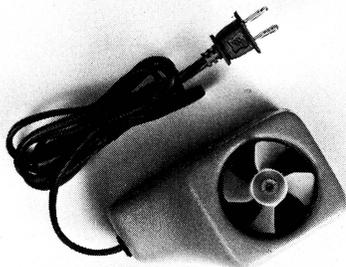


INTEGRATED APPLICATION DEVELOPMENT SYSTEM FOR THE NON-PROGRAMMER



SUP'R'FAN

- Fits inside the APPLE II case
- Powered by 117VAC and does not depend on the Apple Power Supply
- Brushless AC Motor for no electrical noise
- Does not interfere with all present Apple Peripherals
- Mounts with one screw—no drilling required
- Will not interfere with magnetic media such as metal cased monitors or disks in close proximity (less than 1/2 gauss)
- Lowers IC surface temperatures
- Weighs only 18 oz.



SUP'R'TERMINAL

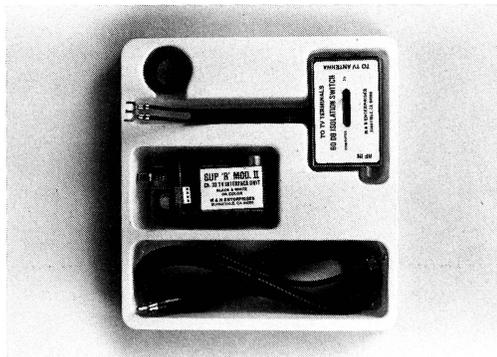
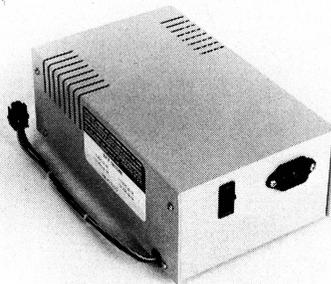
- 80 Columns by 24 lines, upper and lower case; all 128 ASCII characters
- Includes an Upper and Lower case 5x8 dot matrix ASCII character set, and inverse alpha characters
- Character set can be user definable
- Shift Lock feature
- Works with APPLE PASCAL and APPLE BASIC
- Compatible with ALL APPLE II peripherals
- CP/M Output cursor*
- Pascal 1.1 Keypress and type ahead in firmware*
- 3K bytes of bank switched static ram
- 2K bytes of ROM
- The only board with continuous direct memory mapped screened ram
- The only board that interprets VTABS by firmware (version 2.2)
- The only board with an adjustable scrolling window
- The only 80 column board that is synchronous with the APPLE II
- Fully programmable cursor
- Works with CORVUS and NESTAR Systems

*Version 2.5

APPLE II is a trademark of APPLE Computer Co.
CP/M is a trademark of Digital Research

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- 90 to 135 VAC/60Hz or 180 to 270 VAC/50Hz input
- Fully protected — voltage/current
- Overvoltage protection
- 0-50 C full load operating temperature
- Output voltage current
 - +5V @ 6A -12V @ 1A
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- Plugs directly into the Apple II motherboard



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The SUP'R'MOD II is a wide band black and white or color compatible interface system intended to convert the home TV to a full video display for home computers, CCTV cameras and similar systems which output NTSC compatible composite video. The SUP'R'MOD II is pre-tuned to U.S. channel 33 (UHF), includes a coaxial cable and antenna transformer, and in conjunction with a standard home TV set, insures safe isolation and high performance.

SYMBOL	DESCRIPTION	TYPICAL	UNIT
F_c	Vision Carrier	591.5	MHz \pm 0.5
I_{cc}	Supply Current	2.0	Ma
VO (Hi)	RF Output, $V_{mod} = 0$	1.5	Mv
VO (Low)	RF Output, $V_{mod} = 1.5$	-20.0	dB
$R_{in(mod)}$	Modulation input resistance	700.0	Ohm
$V_{osc(Min)}$	Oscillator stop voltage	2.0	Volt
V_c	Voltage	+5 to +12	Volts DC



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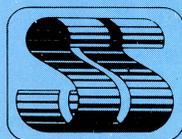
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This colorful high-resolution handbook puts the solar system at your fingertips. The Planetary Guide is a new and exciting way to learn astronomy as you follow the program from the moon and sun, to the planets and their orbits, to comets and asteroids. All major solar system members are displayed in detail. Moon phases and planetary movement are animated on high-res screens. Pick your date and see the location of all planets in orbit as well as where each planet is listed in each constellation. Graphic displays along with text data and detailed tables provide as well as where each planet appears in each constellation. Keystroke commands allow rapid access to any of the general purpose or detailed programs.

Great with The Star Gazer's Guide.
Requires 48K disk with DOS 3.3, Applesoft
\$30.00

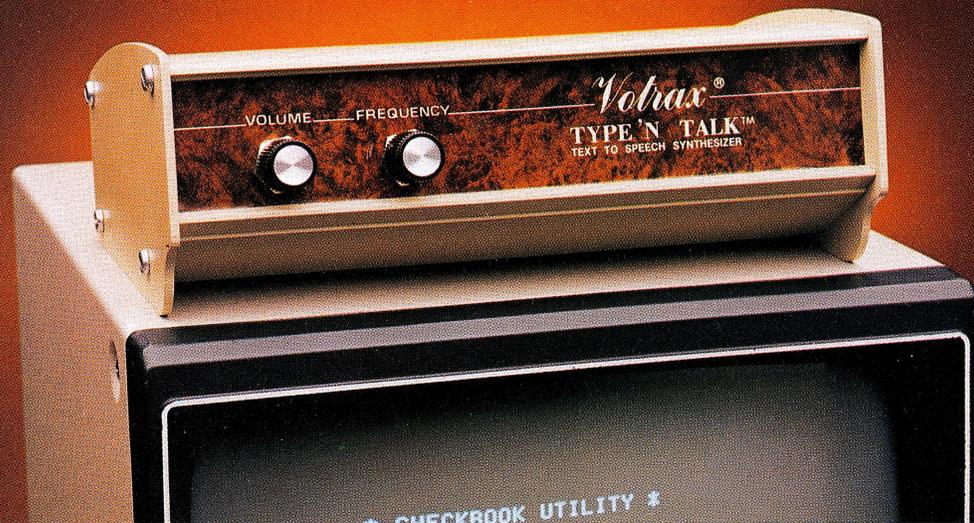


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All programs require Apple II or Apple II Plus. See your dealer for these and other fine Synergistic Software products or order directly.

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- **Built-in text-to-speech algorithm**
- **70 to 100 bits-per-second speech synthesizer**

Type-'N-Talk™, an important technological advance from Votrax, enables your computer to talk to you simply and clearly — with an unlimited vocabulary. You can enjoy the many features of Type-'N-Talk™, the new text-to-speech synthesizer, for just \$375.00.

You operate Type-'N-Talk™ by simply typing English text and a talk command. Your typewritten words are automatically translated into electronic speech by the system's microprocessor-based text-to-speech algorithm.

The endless uses of speech synthesis.

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English text is automatically translated into electronically synthesized speech with Type-'N-Talk™. ASCII code from your computer's keyboard is fed to Type-'N-Talk™ through an RS 232C interface to generate synthesized speech. Just enter English text and hear the verbal

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TYPE-'N-TALK™ has its own memory.

Type-'N-Talk™ has its own built-in microprocessor and a 750 character buffer to hold the words you've typed. Even the smallest computer can execute programs and speak simultaneously. Type-'N-Talk™ doesn't have to use your host computer's memory, or tie it up with time-consuming text translation.

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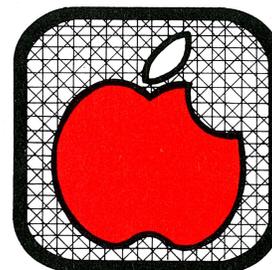
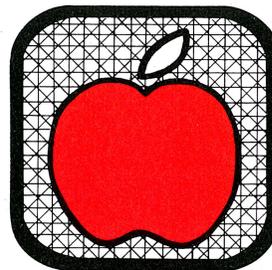
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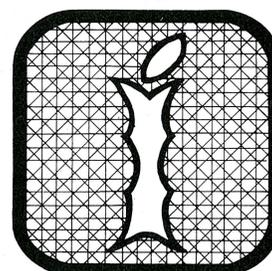
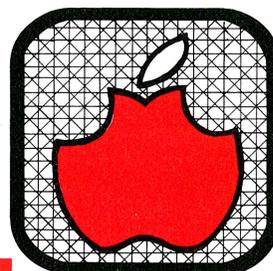
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Type-'N-Talk™ is covered by a limited warranty. Write Votrax for a free copy.



Take a bite...



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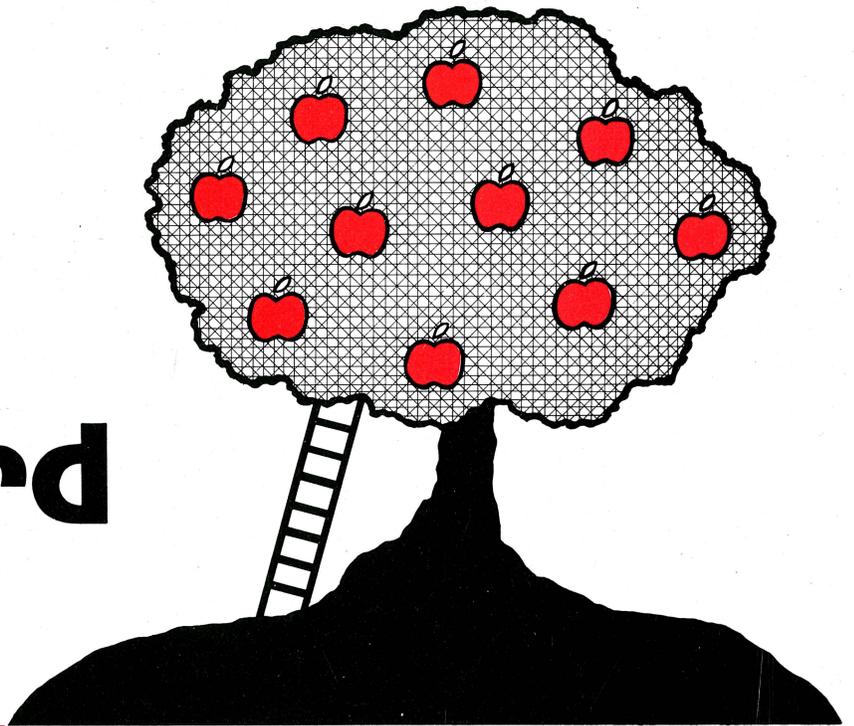
Winter 1981/82

Datagramming , John Couch	14
Where we've been and where we're going in solving applications problems.	
Software Developers and the Apple III , Don Williams	21
A commercial adventure with the new machine.	
Apple vs. Baby Blue: Can IBM Get Personal? , Joe Budge	30
A first look at the new heavyweight entry.	
Payroll with an In-house Apple II Computer	34
Evaluations of four payroll packages.	
Marketing Your Software , Richard Loggins	40
The pursuit of profit as well as fun.	
Apples Down on the Farm , Milo Tenney	46
Agribusiness and the microcomputer.	
A Review of Expediter II , Ken Keen	56
Inspection of one of the new Applesoft compilers.	
Singin' the Disk I/O Blues , Mark L. Crosby	63
How to keep your disk drives on the right track (and sector).	

DEPARTMENTS

Letters	6
Planting a seed . . . , Peter C. Weiglin	9
President's Message , Ken Silverman	10
PRINT FRE(ed) , Val J. Golding	12
User Group Forum , Randy Fields	32
Volunteers and promotion.	
Cycloids , "Dr. Wo"	38
Backup directories.	
IAC Sponsoring Members	72
Forbidden Fruit , Mark L. Crosby	74
Temptations, delicacies, and necessities.	

Apple Orchard



Vol. 2 No. 4 Winter 1981/1982

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What's more, the key means convenience. With one twist of the wrist you can power up your entire system. Plus, you can lock your Apple "on" or "off."

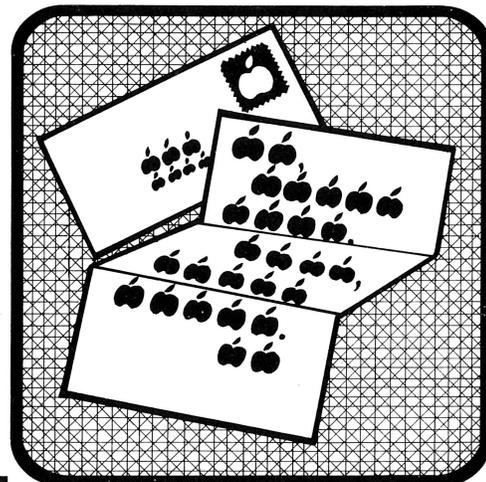
IT MAKES YOUR APPLE MORE FRUITFUL.

That's what happens when you put one over on Apple II. So look for Station II at your computer dealer.

trace

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Letters to the Editor



Sir:

My sons and I are proud owners of a new Apple II, and we would like to offer our compliments on the quality of **Apple Orchard**. If I may, I would also like to offer a rebuttal to the articles on "bootleg" copies and software protection.

The inventors of software have a valid point in claiming property rights for the product of their endeavors. Also, the copyright laws are on their side. However, the concept of infinite rights of ownership is not realistic. In reality, all good things are copied. Hardware, like cars, TV sets, industrial equipment, and so on, all becomes copied sooner or later. Even good football plays are copied.

When I was a designer of early Citizen's Band radio equipment, we saw some of our best work show up in competitive brands within six months after our first batch of production units. Of course, we were outraged, but soon learned to "take it" as compliments to our work, and to protect ourselves by obsoleting past work with improved and cost-reducing designs.

I think that approach would be worthy of consideration by today's software designers. In other words, it would be best for all concerned to keep putting out better work at competitive prices, rather than wasting good resources protecting past work.

Competition is the best means to maintain a healthy business. Welcome to the "Real World", software people! Let's see some real competition!

Arleigh B. Baker
Longwood, FL

Sir:

In the Summer 1981 **Apple Orchard** there is a short question about taking an Apple overseas. There is an equally short answer. Let me add a few notes to "What problems are there. . . ?"

I became a beginner in computers while overseas, which I admit is more difficult; but still, there are many problems that would be encountered by an old hand as well. I'd be glad to correspond with anyone who is having "overseas-related" problems.

When I started, Apple only furnished me the name and address of the Korean Apple dealer, seventy miles away. Even the dealer told me that I wouldn't want to buy from him. Duty is 100 per cent! At least, the prices were about 110 per cent above U.S. mailorder. And he carried no software. But he has been helpful and friendly, and replaced my first disk drive, which got shaken too much in the mail, for a very minimal charge.

Also, on Page 3 of the Reference Manual is a picture of two power supplies for the Apple, neither of which is in my Apple II. I'm going to Europe next year, and probably could have used the 110/220 version if I had known about it.

Sam L. Peel
HAPFF/KOR
30th ORD(Raytheon)
APO SF 96271

(Clearly, we couldn't answer all of the questions about Apples overseas in one short article. In fact, it looks like it could take a young book! Please

keep us informed of problems and answers. In Europe, you'll find a number of user groups; by copy of this memo, Wolfgang Dederichs is asked to keep an eye out for Sam Peel and his Apple upon arrival.—PCW.)

Sir:

In the Fall Print Fre(ed) column, Val Golding posed two most interesting questions:

"To what extent do we (as clubs) want to support the Apple III?"; and

"Do we want material on the III published in the **Apple Orchard**?"

I, for one, would like to vote loudly and vigorously against any coverage of the Apple III in publications purchased overwhelming by Apple II owners. My objections are based on two separate considerations:

1. *Clutter.* Some magazines have tried to be all things to all people (or at least all 6502 people in some cases). The result is Bakanization; a mess; the consumer buys a copy and gets perhaps 10 pages of personally applicable material. If there's a demand for Apple III articles, fine. But don't force me to subsidize it.

2. *User Group or Fan Club?* This goes to the heart of the first question you posed. To extend it a bit further, do we want to act as a cheering section for Apple Computer, Inc., or do we want to take an active role in promoting a course for microcomputing? We all love our Apple II's, but

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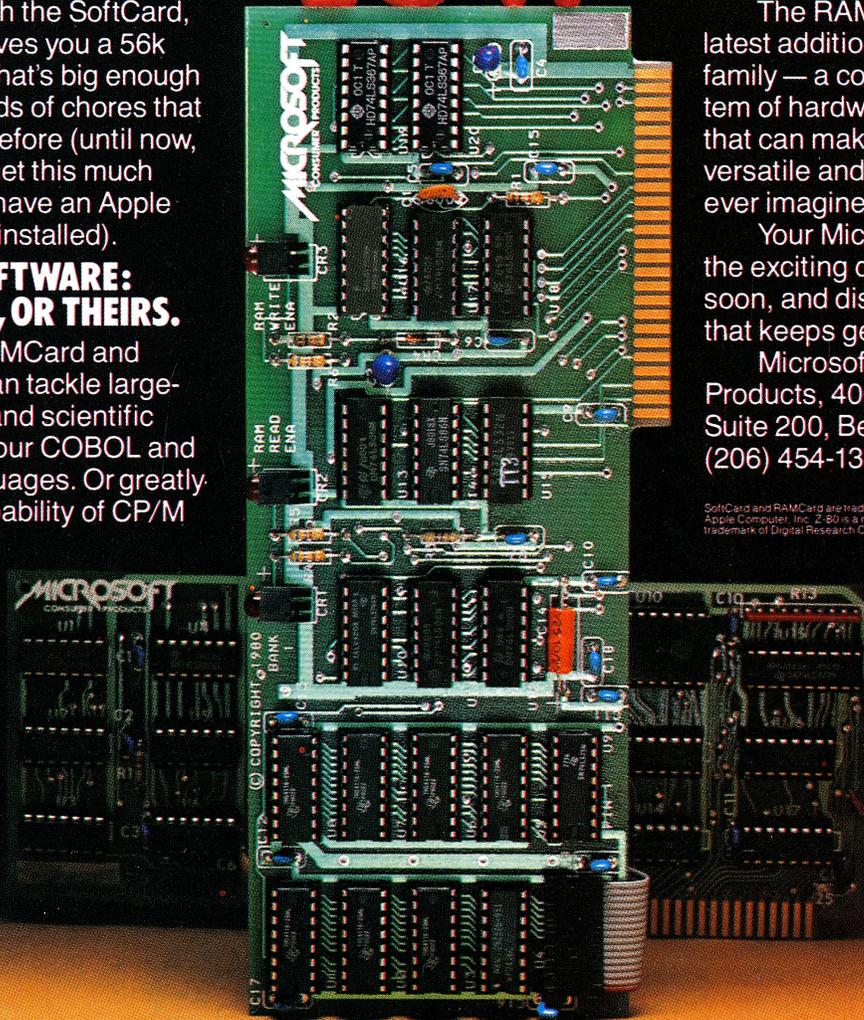
JOIN THE SOFTCARD FAMILY.

The RAMCard is just the latest addition to the SoftCard family — a comprehensive system of hardware and software that can make your Apple more versatile and powerful than you ever imagined.

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MICROSOFT

from a 1981 view, we can admit several deficiencies. Accessing DOS through PRINT statements is mighty peculiar. Lower case is not standard. The Apple II does not work on many modern electronic-tuning TV sets. Applesoft lacks a number of niceties in other BASICS. And a few more.

And the Apple III? Well, it has corrected some of the II's flaws, but the history indicates that the III was a marketing error. Worse, there are scary pronouncements from Apple that the lesson has not been learned, and that they will go on promoting the III.

So back to the question at hand: why should a user group dwell on Apple's faults? The answer is that a concerned user group can encourage those marketing decisions likely to meet with acceptance which can only be good for Apple and users alike. The IBM SHARE and GUIDE groups have certainly had their effect, even on that behemoth. On the other hand, a fan club mentality gives the wrong kind of one-sided feedback to Apple, which could cause them to perpetuate marketing errors, or make new ones. For example, as long as Apple II owners pretend that piling gadgets onto their machines is a perfectly normal way of running a computer, we'll never see some of the new designs that are rumored to be in the works.

Kevin Killion
Chicago, IL

(Yes, we're publishing material on the Apple III, because there is a growing interest in that machine. The IAC Directors and Officers have resolved to support the III or more accurately, not to deny such support to a member user group. Apple The Company screwed up in the III's introduction, but whether the machine is a "marketing error" remains to be seen. What we see is a pioneering spirit all over again. We don't consider this a fan club, or fan magazine, even though some of the material is supplied by Apple Computer and by our other Sponsoring member companies. We welcome a dialogue such as that started here by Mr. Killion; let us know what you think, and keep us on our toes. —PCW)



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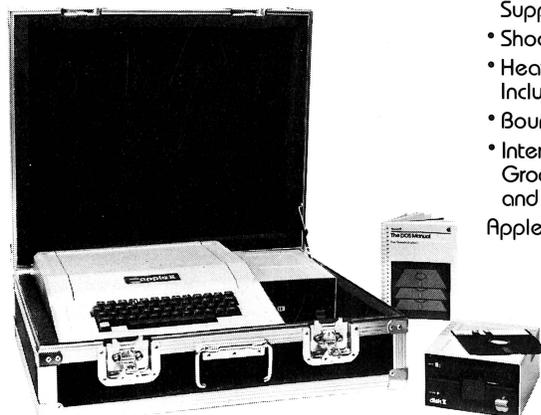
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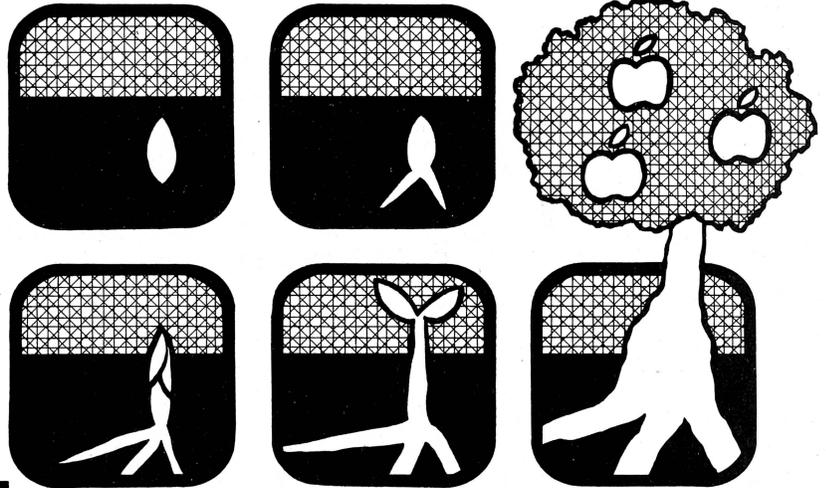
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THE MIND AMPLIFIER

"Oh, you have an Apple Computer? What do you use it for?"

You have been or will be asked that question by any number of non-Apple owners as time goes by. You could list your specific uses, but somehow that answer seems to satisfy neither the questioner, nor you.

So try this one: "I use it to amplify my mind."

Because a computer can be looked upon as a mind amplifier, just as a bicycle or car is a mobility amplifier. Neither type of machine has a life of its own, despite the science fiction writers. To say that the computer does all kinds of wondrous things is misleading. Rather, it is *people* who do all kinds of wondrous things with the computer, and the variety of things that are done with this amplification device is enormous.

The machine does what you want, serious or frivolous. With an audio amplifier, you can have great music . . . or trash, at ear-splitting levels, depending on your taste. (And one person's greatness is another's trash.)

With a car, amplified mobility is good or bad . . . the car doesn't care

if it's an ambulance on a mission of mercy or the getaway vehicle for an ax murderer. The nature of the use depends on the user.

If the computer is an amplifier, it then follows that the quality of the amplified product is dependent on the owner's characteristics, which tailor the input signals. Let me put that another way: a computer will allow a human being to manipulate great quantities of data, yielding a valuable result in far less time than would be required to do that job by hand. That same computer will also allow a human being to make more mistakes per minute than anyone dreamed possible. (Perhaps you've already discovered that.)

It is with deep regret that we reach an inescapable conclusion: the computer will not automatically compensate for our shortcomings; it will not save us from our sins. If a person has sloppy work habits in the manual mode, the computer will not create neatness. There will be a proliferation of paper and disks all over the place (our own kind of "media madness"); you'll still ask "where did I put that?"; and there will be fifty unfinished programs around the place.

Similarly, if a person is a procrastinator, the computer will not automatically generate timeliness. It will help you to create, identify and modify a schedule, but not to live up to it. (Whether it is a comfort to know *exactly* how far behind you have fallen, is a matter of individual taste.)

An amplifier does not evaluate the material it processes; it mechanically augments whatever passes through. The fact that some things may not deserve to be amplified is not for the amplifier to decide, it is for the user to decide. The machine has no value system of its own.

Which, of course, is precisely what the science fiction writers cheerfully overlook in their characterizations of computers as mysterious "super-brains", dominating society by overcoming human imperfections. The computer, while amplifying the power of the human mind, also amplifies those human imperfections, with stunning fidelity.

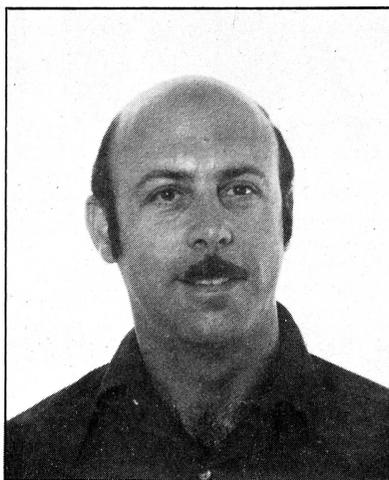
Human nature is closer to the surface than we'd like to think.

RL Weir



President's Message

Ken Silverman
President, International Apple Core



In the last issue of the **Apple Orchard** I wrote about the IAC's plans to open an official office, to speed up and benefit you, the end user, and our member clubs. Well, it has happened. *The IAC now has one address for everything*—that is, ORCHARD SUBSCRIPTIONS, ORDERS FOR PRODUCTS, EDITORIAL MATERIAL, LETTERS (nice or nasty), ADVERTISING INFORMATION, INQUIRIES; you name it and it will be taken care of from this address. As of this writing, the telephone has not been installed, nor have we been given advance notice of the number. Look for our new phone number in the next issue. We will, however, send this information to the member clubs as soon as it is obtained. Further, sometime in the future we hope to have an "800" number installed for your benefit.

Now for the address:

**International Apple Core
910 A George St.
Santa Clara, CA 95050**

The IAC officers and directors are continually asked if we will make the IAC software and Apnotes available

to the general public. Due to this popular demand, in this issue you will find a full page of products that the IAC is now making available directly to you. We have advertised the *Pascal Attach.Bios* in past issues. This includes the disk and documentation booklet. We also have 10 BASIC disks available at \$8.00 each; see the catalog listings in this issue.

The IAC has a beautiful lapel pin, $\frac{5}{8}$ ", made in the form of our "globe" logo that can be purchased for \$3.00 each. Let your fellow Apple users know you support the IAC—wear your pin.

The *Apnotes* we have sent to our member clubs in the past year and a half are now being put into book form and entitled "APNOTES VOLUME I". Information on how to order and cost will be published as soon as we know.

As usual, back issues of the **Apple Orchard** are also available—see the order form for issue number and prices.

If you are planning to start a User Group you might wish to obtain the new INIT USER GROUP binder. This binder contains just about all the information needed to start a group from scratch—sample By-laws, 4

disks to start a software library, how to put a newsletter together, etc. The cost of \$50 will be partially refunded when the new group joins the IAC.

NEW SOFTWARE— FOR THE APPLE ///

The following software is now available for the Apple /// through the IAC:

File Cabinet—with 9 pages of documentation—this is a small DBM written in Apple Business BASIC.

Two new drivers—RS232 for communicating in both directions through the serial port; and a Thunderclock driver so you can address Thunderware's clock in the Apple ///.

Do you want to move those VisiCalc files, or for that matter other Apple II text files up to the Apple /// and then use them? Well, order the *Apple II Text File to SOS* converter. (This requires that you have a second Apple /// disk drive).

What would you, the Apple Users, like us to provide for you?? Please write our new address and let us know.



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PRINT FRE(ED)

by Val J. Golding

SOME INTEGER INPUT

Lost in the myriad of Apple II Pluses (Minuses) produced in the last two years, Integer BASIC seems to have retrogressed to "poor cousin" status. Originally, Integer BASIC, written by Apple co-founder Steve Wozniak, was the "home", or main board language of the Apple II. It remains currently available in three forms: as a plug-in firmware card for Slot Zero, as the alternate language with the Language card or a Slot Zero RAM card, or as a RAM version available from some user groups, notably A.P.P.L.E. and the San Francisco Apple Core.

Indeed, we do not question the advantages of double-precision floating point arithmetic and the other powerful math functions, nor Applesoft's admittedly superior string-handling capabilities. However, it is precisely at this point that many newer users miss the boat and fail to determine which BASIC is more suitable to the application at hand.

As the name implies, Integer BASIC is limited to integer numbers in the range $+/-32767$, and herein is the point of our tale. Applesoft, no slouch itself in terms of execution speed, is abysmally slow when compared to the stark simplicity of Integer. Published benchmarks give In-

teger a wide edge with speed improvements of from 10 to 75 percent, depending on the specific application. Moreover, with the arrival on the scene of compilers for both BASICs, even more impressive execution speed statistics have been collected. For example, one test program which took over 45 seconds to run with the Applesoft interpreter took about 15 seconds in the compiled version, and *less than 3 seconds* in the Integer compiled version.

So, of what value is that extra speed when I'm limited to whole numbers, you may ask. One application that immediately comes to mind is games. (The first name that Woz pinned on Integer BASIC was *Game BASIC*). Games rarely require real numbers. Try to beat "Little Brick Out" in Integer BASIC. Another thought is checkbook or invoicing programs where the total is not expected to exceed \$32,000. Two place decimal input is easy to simulate.

Lastly, comes the carrot with which to tempt you beginners. Consider these two facts: all but a handful of Integer BASIC commands or keywords have identical counterparts in Applesoft; unlike Applesoft, Integer checks the user's syntax *upon entry*.

Thus it is rarely possible to enter incorrect syntax, adding to our previous accolades of Integer as an ideal beginner's language.

Bearing in mind the inherent limitations of Integer BASIC, how can one best work around them, if need be? Comes now the crux of our message: over the past few years we have written or co-authored, and published, utilities to compensate for most of the lacking features. These Applesoft function simulations include:

CHR\$(X)
VAL(X\$)
STR\$(X)
X\$(I)
**Decimal add, subtract, multiply
 and divide**
SQR
Using PRDEC.

Such a collection of utilities may be set up in text file form and EXECed into programs as required.

We therefore ask that you the reader, as well as our IAC member clubs, drop a note to the **Apple Orchard**, to this writer's attention, indicating your desire to see this group of Integer utilities printed in a future issue.





Power Tools for Programmers



Shape Master

This powerful utility allows you to rapidly create, combine, display, edit, save, and print out high resolution shapes for use in your Apple programs. Two separate, convenient entry methods on five user-selected grid sizes ranging from 13 by 23 to 39 by 69 allow for easy definition of many different shapes. A built in character set in three different sizes makes it easy to mix text and graphics in your displays. The "smart" printout routines allow you to make a hard copy of your shapes, even with a non-graphics printer. A reverse command allows a quick mirror



image of any one of your shapes. The edit commands allow you to edit shapes and shape tables, thus you can create, load, merge and delete individual shapes from your shape table. The illustrated, comprehensive manual includes tips on using shapes in your programs. Four games and two graphics demos are included on the diskette to illustrate what you can do with this program. This package was reviewed in *Creative Computing*, June 1981, page 44.

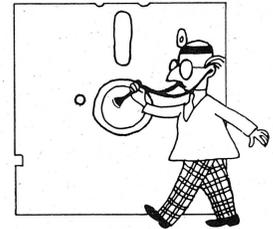
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DATAGRAMMING

by John Couch
Vice President, Software
Apple Computer, Inc.

The concept of datagramming grew out of some thoughts as far back as 1976 on the direction of software. Five years later, I think it's appropriate to go back and look at some of the things that have changed, and that haven't changed; and in particular, in the personal computer business. All of this started in 1976 when I was at Hewlett-Packard, and basically responsible for their software development and architecture. I realized that what we really had to do was to move software toward the non-programmer; i.e., provide solutions for the non-programmer. In doing so, I realized that building this kind of system for a \$100,000 computer (remember where I was at the time) wasn't going to have all that widespread a market, because there weren't too many non-programmers around who could afford \$100,000 computers.

So I started looking at other types of computers, and had lunch with Steve Jobs one day in 1978. He convinced me that Apple basically had the same philosophy that I had in terms of attempting to provide solutions for that non-programmer. Steve gave me an Apple II, telling me to take it home over the weekend and try it to see if I liked it. I took the thing home, plugged it in, and for the first time in my life—seven years at H-P, eight years at school—my wife knew what I did for a living.

Up to that time, my folks thought that I was in the Mafia or something illegal, based on the money I was bringing home. However, the biggest impact was on my kids. At that time, they were about seven and three years old, and they were immedi-

ately attracted to the color and sound of the games. By Sunday afternoon, I said, "Hey, now let's not get too interested in the Apple because I haven't made up my mind yet. I may have to take it back". And they said, "What? All you have to do is say 'yes' and we get to keep this? Say *yes*, Dad!"

At the time, that decision cost me. . . let's see, I left Hewlett-Packard managing 141 people. I went to work at Apple managing nobody, working along with Steve, at a \$15,000 a year reduction in salary. So everybody thought it was the craziest decision I ever made. Turns out it was probably one of the best decisions I ever made, not only from a financial standpoint, but also from an educational standpoint. What we have been able to do in the last three years, and some of the things you will see in the future from Apple, are remarkable. And the kind of commitment that Apple has made to software, and is continuing to make, is what's allowing that to happen.

There are two basic concepts I want to discuss here. The first is applications, and their evolution; and the second is tools, and their evolution. From a traditional software standpoint, the application has been considered the solution. The languages and operating systems have been considered the tools to create the applications and therefore the solutions.

Around that time, I was trying to address a need that my father had when he ran his own business. I came home one day, and he said, "I'm losing money. I'm trying to run this busi-

ness, but I'm just losing money. I can't keep control of it."

I said, "What's the matter, is someone stealing it?" (He used to own a liquor store, and they used to steal him blind.)

"No," he said, "I just can't make the decisions. I can't tell whether the money I'm putting into advertising is paying off. I don't know what I'm selling. I don't know what I owe. I don't know what I have in the back room in inventory. I just can't control this business. Do you have any suggestions?"

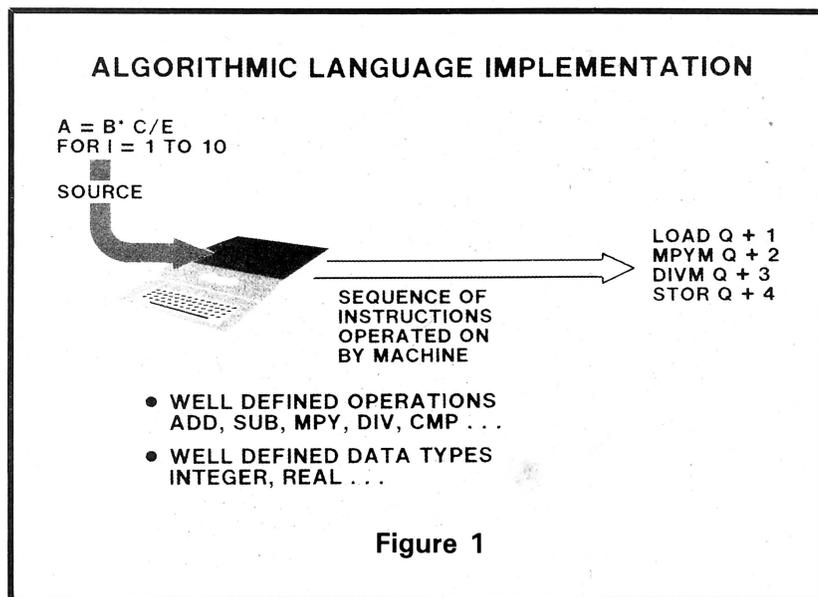
I said, "Well, have you ever thought about computerizing the data? Getting some of the data in and being able to ask some questions and see really where you stand?"

"Is that possible?" he asked.

"Yeah," I said. (It was about late 1977). Why don't we go out and buy a microcomputer?" (At that time, you could go out and buy something for about \$600). "You know it's all tax deductible. I'm going to be here all weekend. Is it worth your while to try to put a prototype software system together to model your business?"

So we did that. I wrote a BASIC program for him that told him what his daily transactions were, inventory, sales, etc., and measured things. By Sunday we had it up and running, and he could see his business.

The problem was, every time I went home to visit, he would put me to work. Because I made the mistake of writing that program in BASIC, and he didn't understand BASIC, every time I'd go home he'd have this



new thing that he would want to know about his business and I would be in the back room for the weekend, coding. I said, "There's gotta be a better way! There's gotta be a system that I could put together for my dad that would allow him to define his screens, his inputs, for him to define his reports, him to define the relationships with his data. And that's the direction I really wanted to go.

So I said, "Where's the best place to start?" The best place to start is to look at an application, and that's very simple here. I broke down an application into four functional components. In every piece of software I have ever written (and I have written a lot of software; my first degree in computer science was in 1969 at Berkeley, when it was the only school in the country giving out undergraduate degrees in computer science), I realized that there are four components, and it didn't matter whether I wrote it in Fortran, BASIC, COBOL, Pascal, or whatever. (1) I had to be able to do some sort of computation. (2) I had to get the data in. I had to verify that the data coming in was in fact valid, and (3) I certainly wanted to get the data out, in the form of a report, or graphics, or whatever. In the meantime, I had (4) a set of data structures within that program that allowed me to move the data from disk to memory and around into the algorithms. So I approached it from that standpoint: computation, input, output, and data structure.

The question was, if an application is truly a solution, and those are the

components of the solution, are there other ways to provide those functional capabilities other than through traditional programming languages?

The first thing that came into my mind was the concept that I call the expansion of language capabilities. I looked at languages like COBOL and asked, "What are they trying to do?" They were trying to expand COBOL into the output areas, into the input areas, and into the data structures area. They're taking the fundamental syntax of the computational aspect of a procedural programming language, and adding syntax to it to provide more tools, more capabilities for the programmer, thereby making the application easier to write.

If you look at a lot of software, you'll see that's true. Certainly, that was the approach that Apple was taking early in the game with Integer BASIC. Then they decided that Integer wasn't really that powerful of a tool to address a number of the solutions that they wanted to provide, so they added Floating Point BASIC (Applesoft), and they attempted to expand the capabilities of BASIC.

The second approach is what I call loose coupling of tools. This was the approach that the minicomputer industry seemed to be taking. They had the programming language as the center of this development environment, but they were trying to do standalone packages for data entry. You could specify your input form and say, "OK, this is going to be the label 'Vitamins'." You could specify your labels, you could specify your

data entry field, you could specify that it was alphanumeric, or that it was in the range between 0 and 99. What you did was to generate, interactively, a portion of the *application*. At run time, whatever language you were dealing with would interface with these interactive structures. We had developed a package called VIEW for data entry, another package for report generation, and a standalone graphics capability. We could say, "this is a pie chart," and put data in interactively to see the pie chart change. We could also pass data to those packages at run time.

It was a step in the direction of facilitating the development of applications, but we still had that programming language in there; it was required as the "glue". So what were some of the problems in this approach?

Some of the problems we found first were, inconsistent interfaces, in that it was tough to control the people who were off in a corner doing data entry, people over here doing databases, over here doing graphics, and the interfaces weren't the same. And when you did try something new, as for example at H-P, the company tried to carry it back to the existing customer base, asking, "Well, what's the relationship to our existing packages; is it consistent?" Sometimes it's pretty difficult to break out and do new things if you are always constrained to be consistent because of a customer base.

Each of the packages had different design environments and redundant data specifications. What I found out was that I had declarations in the programming language, and data specifications in the database language. Whether you knew it or not, when you specified that this field was of value, it was a specification, and we had specifications in each one of those modules, making them somewhat inconsistent.

Data structure movement—moving data back and forth between the data entry, report generation, graphics, word processing—was also difficult and inconsistent, we found. We also found overlapping functions; for example, you still wanted calculation capability in the data entry; you wanted to read in a number and multiply it by Pi, for example. And there still was a need for calculation in reports; this column multiplied by the sales tax, etc. All of

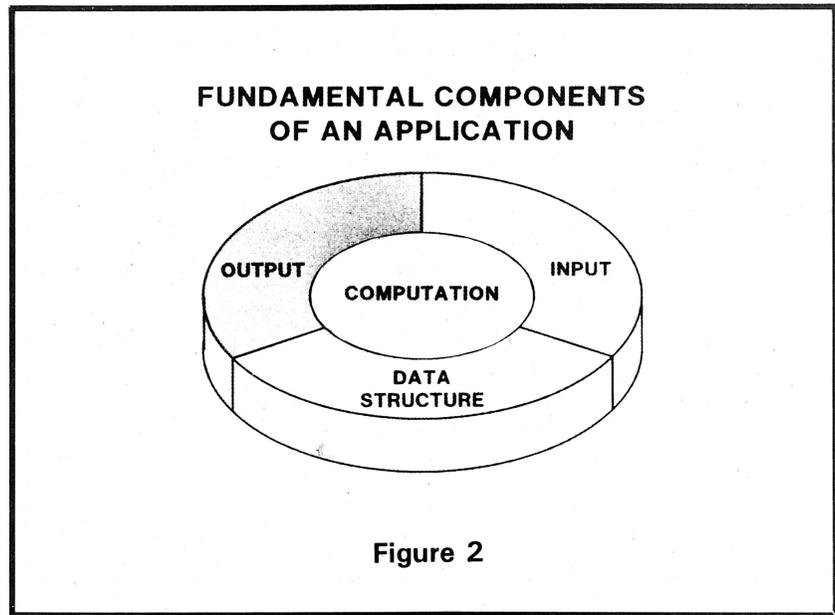
a sudden there were four calculators built in there.

So what we wanted was an environment that didn't have a procedure-oriented programming language in it. I wanted to integrate the functional capabilities required to create applications *without a programming language*. I wanted to be able to—no, I wanted *my father* to be able to—inquire, query the data, ask questions, and modify the thing to meet his needs.

How far have we come along this track in four years? Well, we wanted to integrate the more common Electronic Data Processing (EDP) functions, and to provide these traditional functions to non-programmers. And in 1976 I certainly wanted to take advantage of the potential of the new interactive devices; bit map displays, graphics on-screen. All of these graphics, including forms generation, had to be interactive; you had to be able to sit there and interactively generate your application. I look at VisiCalc as probably the first piece of software in the personal computer business that allows a non-programmer to do something, but it's very limited. Calculation is there, but input and output are essentially fixed in matrix form, and query and sorting aren't there yet. But it's the first program, really, with which a non-programmer can sit down and instinctively create an "application", a solution, and then make some changes in a keystroke-responsive manner.

Keystroke responsive; a quality that isn't always there in larger machines. The minicomputers were going in the direction of timesharing, and with a shared CPU, you wait, that's all. We wanted to put more power into the terminal, and the result was a personal computer. Now we see personal computers tied together in networks as an alternative to timesharing.

We also wanted an information user system, rather than a data processing programmer's system. If you work in a large company, you know what I mean. You get a six-inch thick report at the end of the month, and say, "This has some neat information. I'd like to see a plot of this, or can we present the data another way, or what if we do this?" Well, you had to go back to the Data Processing Department and they did it, when and if your "priority" came up. What



you really want would be to have that data available to you, right now. With the personal computer, *you* are the information user; you model the data, plot, cut, and paste, and then use the data.

That's the evolution of the applications concepts; from expansion of language capabilities, to loose coupling of tools, to totally getting rid of that language. So let's look at our second theme, which is languages, and let's look at these tools as two categories: algorithmic languages and specification languages.

Everybody is pretty familiar with algorithmic languages; Fortran, COBOL, BASIC, Pascal, and all the others that provide us with a step-by-step algorithmic approach to problem solving. With specification languages, we're not so much interested in how-to-do-it, but rather *what* to do. My dad in that store knew what he wanted to do, he just didn't know how to do it. What I needed to provide him with was a tool, so that he could say, "This is what I want to see in my reports, this is what I want to put in my computer, and this is what the relationships are going to be. I don't care how it's done, I just want the results, and these are the kinds of questions I want to ask." OK, Dad.

We know quite a bit about algorithmic language implementation. I spent eight years in a computer science environment learning how to write compilers and operating systems, and we really do have the implementation of algorithmic languages down to a science. A source

statement such as the arithmetic expressions, or assignment statements, coming in through the processor, generating a sequence of instructions which are operated on by the machine. In the typical machine architectures of today, the operations (add, subtract, multiply, divide) and the data types are all very, very well defined, and therefore the results are also very well defined. It's comparatively simple to put these types of things together.

But that's not so true for specific languages, where the operations are no longer simple arithmetic operations, but rather tend to be relational in nature. The operators are no longer 16 bit integer or 32 bit floating point numbers, but they tend to be data structures. For example, give me the names of all the people in Building 2 that make more than \$25,000 a year, that graduated from Berkeley after 1975 (*Note: "Berkeley" as used here apparently refers to one of the campuses of the University of California, noted for the consistency of its football teams. —PCW*), that are up for a raise, something like that. Look at that particular query, and you find data structures: lists of people, tree structures, and a ton of relational type operators, not just calculations. It's a much more difficult problem, as we ask about the result of applying this sequence of relational and arithmetic operators on these different data structures.

Yet, specification languages will become more and more common. I

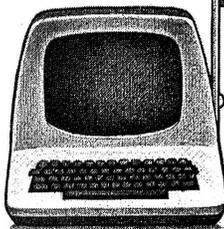
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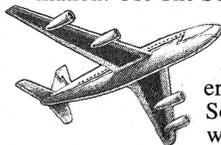
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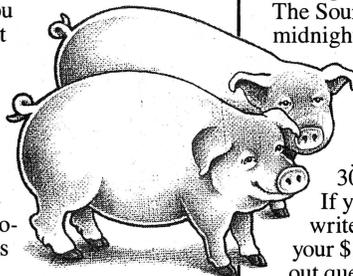
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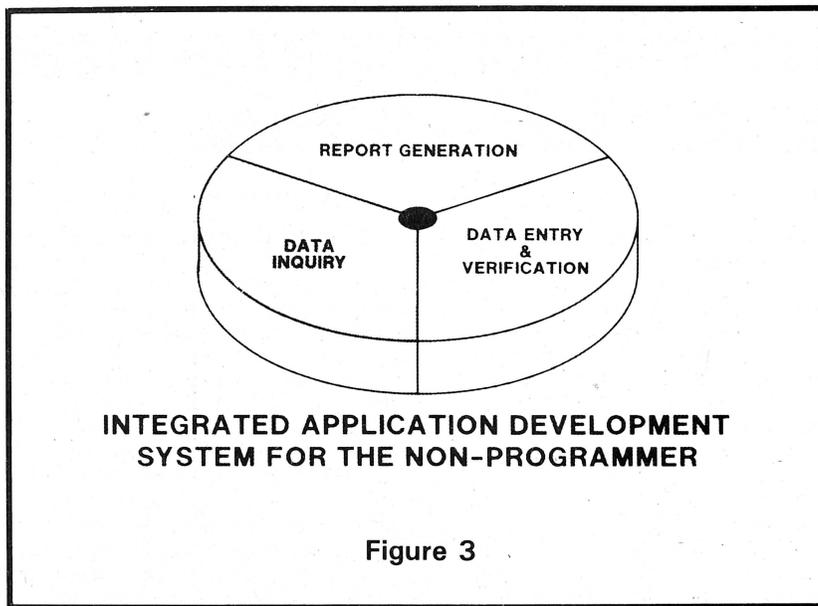
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think algorithmic languages will continue to be around because there is a ton of COBOL programmers and BASIC programmers, and a ton of software out there that needs to be maintained and updated. But I think we'll move toward specification languages, and I think VisiCalc is a single example of that, with limited capability.

We're going to have to advance in two areas. One is the user interface, or human engineering. With procedure-oriented languages, it wasn't difficult to address the human engineering aspects of those, because the government did it for us with the ANSI standards. They told us what COBOL should look like, what FORTRAN should look like, etc., and you implemented that syntax.

That's not going to be true with specification languages, and there's a lot of work and study to do in human engineering. We have to understand what people will and won't accept. For example, as powerful as VisiCalc is, I think it's not a very user-oriented package. We need to grow in that area.

The second area is understanding the complexity of the implementation; if we want the user to have it easier, we have to do more. We're dealing with different algebra, it's not cut and dried; it's just not as simple. I have a 700-page textbook out on compiler construction which tells you how to write these compilers for algorithm languages, and it's duck soup. (*Sez you!*—PCW) But it doesn't

get too far into the areas we're talking about, and it's these two areas where we have to put our software research money and effort.

Let's talk about user interface. I went to school for eight years in computer science, and there was nothing in computer science programs that really trained me to understand people's problems—like my dad's. To understand what he's trying to do, and therefore the human engineering aspect of what he's comfortable using, is a long way from where most of us are, in the nuts and bolts, down among the bits. We've got to move from there. We have little information on what is acceptable interface. Yet we must study this area as much as the implementation detail in order to understand how the user will react. In three years, I've seen more than 250,000 Apple II's go out, so I know this is becoming particularly important in the personal computer field.

That user interface area was defined in the past by government standards, as I said. In the 1980's, specification languages, like interactive form fillouts, will dominate the natural languages. Being a computer scientist, I'm convinced that I cannot implement full English. But English isn't necessarily the approach to take. Four years ago, a lot of people were spending an awful lot of money trying to put the English language on the computer; what we found, in general, was that there are better ways.

Another point was, it was always easier for us to create programming

languages for mathematicians, engineers, and computer scientists than for non-programming individuals. We have APL, a matrix-oriented language, with lists, sets, maps; LISP for recursive evaluation; and for various combinations, a language called SETL. There isn't a Computer Science language professor in the country who isn't playing in his own playpen somewhere, developing his own language, normally based on mathematical models. Strings, patterns, etc: SNOBAL. Classes of objects interacting through discrete events: SIMSCRIPT, SIMULA, GPS, and other simulation-type languages. Algebraic formulae: ALGOL, Mathlab, FORTRAN. Dozens and dozens of languages. But individuals of all kinds are now using personal computers for their daily work, and very few people are attempting to address the types of problems of putting computing power and solutions in people's hands. I think Apple has to address them.

What should these new specification languages do? We need to develop a consistent internal representation for the information. In other words, we have to come up with a data structure that will allow us to store text, graphics, video, voice, whatever functionality we want to provide in that personal computer, and to be able to pass information from one module to another. I want to be able to interactively define a pie chart, then take that pie chart and throw it into my word processor without swapping diskettes and reading multiple files, or having to be very knowledgeable about the operating system. I want to take that pie chart, mentally cut it out of the screen, and drop it into the word processor. Yes, that means mixing data structures for screen graphics with data structures for typed information.

We need to understand the algebra of these structures, and how to take two or more structures and operate on them. There's no instruction in the machine which will help you do that, which is why all the work goes into the software. The concept of specification languages isn't all that new, but the operators and operations are more complicated than the corresponding data values, operations, and rules for our programming languages.

Since the algebrae of our user-access languages will be more complicated, marrying them to our conventional architecture is more difficult. That implies more software, which implies more memory to run these types of languages efficiently. Therefore, we will see personal computers with one or even two megabytes of memory, because the solutions will require more software until we alter the way we create hardware. We'll no longer have an instruction called "add"; rather, there'll be this subroutine in software that takes these two data structures, massages them, and produces a result.

The key point is that we're trying to provide a *solution*. So, software must drive the architecture, the machines in the 1980's. We'll have to get the logic designers away from their thinking that all they need to do is to add and subtract integer and floating point numbers and put that into the hardware of the machine. Instead, we'll approach this by looking at what we're trying to do; what kind of problem we're trying to solve. Then we'll build the machine from both the hardware and software standpoints, based on those functions we want to provide. I think you'll see a different type of computer architect in the '80's than we see today. At least, I'm now in the position of having a hardware team working for me, so we'll drive the hardware in the appropriate direction.

Figure 4 summarizes some of the ideas that go into the concept of Datagramming. Before 1980, I saw a

lot of people programming, writing a lot of code in algorithmic languages. What I wanted to evolve to was a tool, a system, that allowed people to solve a problem by specifying what they wanted in terms of inputs, outputs, relationships, etc. The figure shows the distinction between a "programmer" and a "datagrammer". The best example of that, in its rudimentary and simple form, is VisiCalc. When you sit down and specify things with VisiCalc, you are programming, in a sense. The template you create is the program, and you can modify that template. There's a whole cottage industry creating VisiCalc templates springing up; what surprises me is that it hasn't happened sooner. And there will be follow-on packages to VisiCalc; it was a great prototype.

But we can't get caught up in worrying about the day-to-day things with VisiCalc. Maybe we go into the next room and start over, adding query capability, sorting capability, graphics capability, all integrated; into a development environment that allows you to create this new type of template, credible to and modifiable by the non-programmer. We must go in that direction if we are to avoid some of the mistakes made by the minicomputer industry.

I joined the minicomputer industry in 1969 when they said "Minis are nice, but they can't do anything." When I joined the personal computer industry in 1977, they said, "Personal computers are nice, but they can't do anything." We can't be com-

placent with what we have; we have to go on to develop new technologies. I'd like to create a whole new market of datagrammers. My dad, by the way, has become a datagrammer; he uses VisiCalc and a few of the other database packages, and some plotting packages that are on the market now, and has been running the whole business on the personal computer for three years now. And I no longer have to write programs for him; I can go home and see Mon and the rest of my family.

There are some dangers facing this industry; let's call them minefields. Once, when Sir Isaac Newton was asked how he made all his discoveries, he replied, "If I have seen further than others, it is by standing on the shoulders of giants." Well, in the programming field, I think we mostly stand on each other's feet. There are two potential directions the industry could take, and there's this minefield. On the other side of the minefield are "some very successful computer companies", like IBM, DEC, and H-P. On this side are all of us startups (yes, I still think of Apple as a "startup"). A serious mistake that many firms are making is that they see the paths others have taken through the minefield, and they're saying "That's the true path." They're saying, "We can now put COBOL on every desk, and just think of all the COBOL maintenance modules we can build. . . ." they'll do FORTRAN, COBOL—They'll put on a micro everything you see on a mini. That's the safe direction.

But the direction I'm interested in is entirely different; it's the direction for the non-programmer, the solution for the individual. The introduction of the personal computer into society. I was at H-P when we did the HP-35, and we paid something like \$100,000 for market research, and they came back and said, "Don't do it, nobody wants it." And Bill Hewlett said, "I don't care if nobody wants it, I want it, and I want it to fit right here in my pocket!"

I see a sort of parallel between personal computers in the 1980's and the effect those calculators had in the 1970's. There's a strong tie there. We have a large amount of resources going into those solutions for individuals, hardware and software. What I want to do is to provoke you into thinking about that future, and how we get that job done.

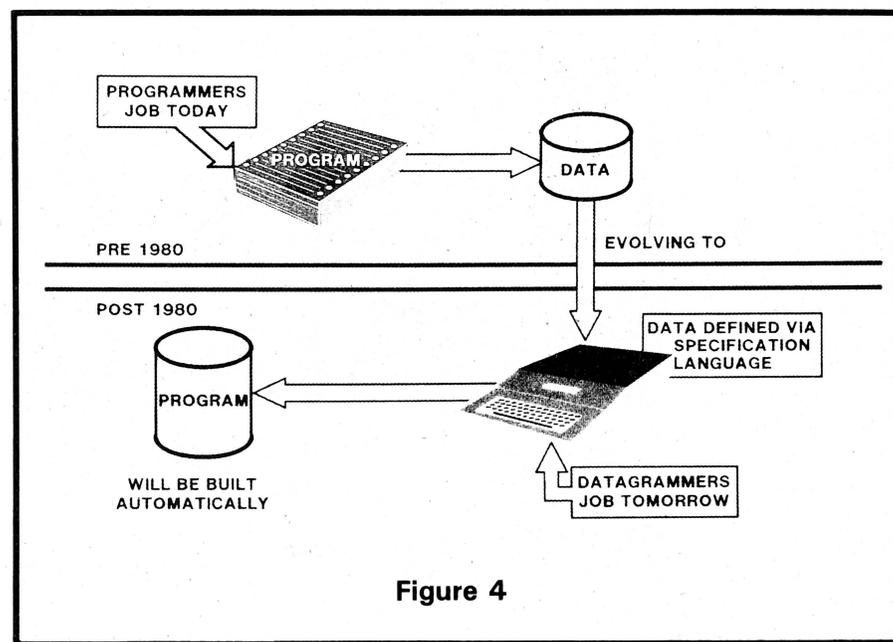


Figure 4

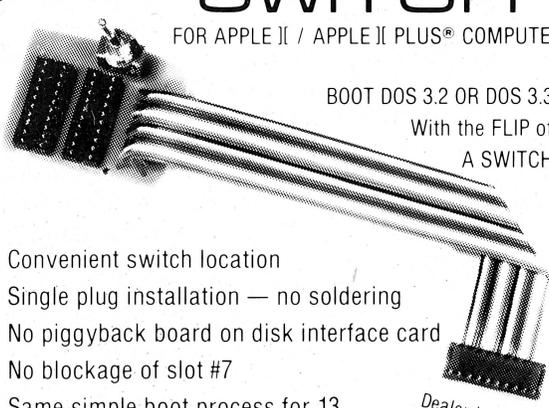




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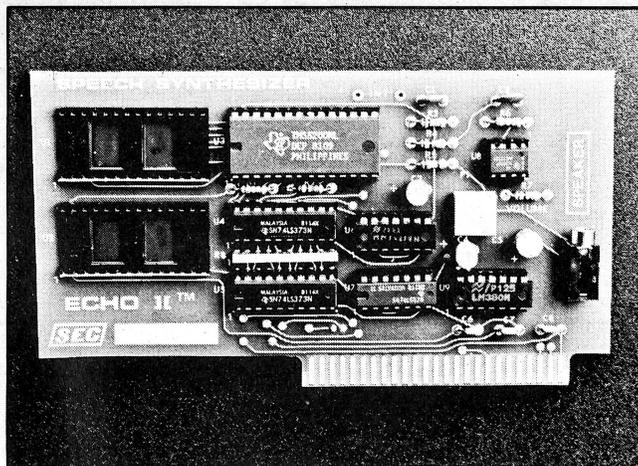
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SOFTWARE DEVELOPERS AND THE APPLE ///

by Don Williams
Apple Computer, Inc.

You've heard and read about the problems of the Apple ///? Well, I experienced most of them. I got an early Apple /// in November 1980, before any were shipped out of Apple Computer. Heat problems. Intermittent failures which were "fixed" by picking up and dropping the system from a height of two inches. Chips rising out of their sockets. Frustrating. Disappointing.

But by late February I started to hear that the problems were licked, so I decided to see for myself. While I had fooled around a bit on the ///, I hadn't done anything serious, so there would be a lot of learning involved.

Now, I work at Apple as Manager of Sales Support. Independently, I am the developer of a software package called DESKTOP/PLAN. Getting DESKTOP/PLAN up on the Apple /// would be a good test, as it's nearly 100K of BASIC code. My overall work and travel schedule limited the available time to this job, so I decided to convert it "as is", straight off the II.

That turned out to be very simple. First, I created Apple II "text" files from all the program modules and converted these to Apple /// SOS files using a utility available from Apple. Then I corrected the "syntax errors" created by the differences in AppleSoft and Business BASIC. Last, I had to re-write all the file handling, which was pretty easy, as I had file handling routines common throughout all the modules. In less than 40 hours on the keyboard, I had DESKTOP/PLAN, with all of its features and its nearly 100K of code, running on the /// in native mode (not emulation).

During this cycle, I started to really appreciate the many new features

provided by SOS and Business BASIC. In fact, once I got into it, I decided that I could take advantage of these features to incorporate some major functional enhancements and features that I didn't do on the Apple II because of hardware or system software constraints. That rewrite took about five weeks, and DESKTOP/PLAN now has new functions and a redesigned user interface.

What was taken advantage of there were improvements and features of the Apple ///. It provides several new hardware features not found on the Apple II, including 80-character wide video display with upper and lower case alphabetic characters, a new full keyboard with four cursor keys and a numeric keypad, and 128K of memory. Software is based on the new "Sophisticated Operating System" called SOS, and an enhanced Business BASIC. All of these features can be used to improve the functional capability, performance, or user interface in the application software.

For instance, the memory increase from 48K to 128K (*Just try to find a 96K Apple ///—PCW*), which meant that the size of the program that can be operated in DESKTOP/PLAN was increased from a maximum matrix size of 2700 elements to 9000 elements.

Several functions which had been programmed in separate modules have been combined so that there is much less program chaining. The system runs significantly faster, with fewer user waits.

The 80-character screen width and upper/lower case allowed me to redesign the user interface so that the user is much better informed about

what is happening and what could or should be done next. And the really enhanced keyboard helps, as with the four arrow keys replacing the I, J, K, M convention on the Apple II.

The system software also allows more flexibility and power. Two examples: Business BASIC's WINDOW statement allows the programmer to define easily that portion of the screen which is to be used. A screen window can be set with these statements:

```
10 REM Set Window
20 LEFT = 20 : REM Left Edge
30 RIGHT = 60 : REM Right
   Edge
40 TOP = 9 : REM Top Edge
50 BOTTOM = 16 : REM
   Bottom Edge
60 WINDOW LEFT, TOP TO
   RIGHT, BOTTOM
```

Thereafter, anything printed to the screen will appear only in that window, without interfering with anything previously printed on the screen.

The SOS console driver provides an easy *four* direction scrolling capability instead of the normal single direction. To scroll left 9 character positions within a window is as simple as:

```
10 REM SCROLL LEFT
20 AMOUNT = 9
30 PRINT CHR$(23);CHR$(
   AMOUNT);
```

Scrolling up, down, or right are just as simple. These features al-



lowed me to scroll throughout the matrix in all directions on the screen, never blanking the screen leaving the user wondering what's happening in there. The illustration of "entering the model definition" used all of these features. I scrolled right and left for the column headings as well as up and down for the row descriptions within three different windows. What has been four different functions, with the user having to remember what was where on a continually changing screen, had become an easily understood single function.

Overall, most of the additional functions I put into the system, other than those described above, could have been done with an Apple II, if the memory had been there. But the real benefits to me as an application software developer were the features of SOS and Business BASIC which contributed to my ease of development.

The first, and most easily recognizable benefit, was the very fast program loading and chaining, compared to the Apple II. For instance, loading one of the modules in my system takes 15 seconds on the Apple II. It takes only 4 seconds on the III. That's a dramatic timesaver, par-

ticularly in debugging a large system.

But more important was a feature I discovered by accident. In most BASICs, when a running program is interrupted and a program statement is changed, all of the variables are destroyed. If this program is several levels down the chain, the program must first be *SAVED*, and then the calling program(s) *RUN*. This means the files have to be read and the sub-programs chained in. In *DESKTOP/PLAN* on the Apple II, there was often a full minute lost in "saving and running".

In Business BASIC, the variables of the current program are *NOT* destroyed when a program statement is changed, or statements are added or deleted. Thus, a simple *GOTO* statement will restart execution of the user's program without the significant loss of time incurred in every other BASIC I have ever used. Another dramatic timesaver.

While I don't know how much time it actually saved, the "type-ahead buffer" allowed me to type an entire set of commands, then sit back and watch them be performed. It seemed to me to speed up my testing.

A major factor easing my development effort was a result of the way

SOS manages external devices such as the keyboard, console, printers, and disk files. External devices are defined to and managed by SOS through a series of "device drivers", which make all devices look like "files" to SOS, with one difference depending on whether the device is a "block" or "character" device.

Block devices have both a volume name and a device name. Information is recorded to and retrieved from "logical files" in 512-byte blocks. Files are accessed with a "pathname". When accessed from a user-written program, SOS automatically finds the file from its pathname if the volume is "mounted" on the system. Character devices have device names and are accessed solely by this name. This device name is always preceded by a ".", as in ".PRINTER". When the system is booted, the drivers are automatically loaded. Thereafter, they are used by the application programs like this:

10 OPEN #1, "devicename"—
for character devices

or

20 OPEN #1 AS INPUT,
"pathname"—for block
devices
30 OPEN #2 AS OUTPUT,
"pathname"

The "pathname" may be as simple as a single file name, or it may be a series of directory files preceding the file name, with "/" separating the steps on the "path". Example:

/PLANDATA/TOPNOTCH/
TOP13

where

PLANDATA is the volume name
of a diskette;

TOPNOTCH is a sub-directory
on the volume **PLANDATA**; and
TOP13 is a file within
TOPNOTCH.

Once a device has been *OPENed*, data may be routed to the device by including the "channel" number, 1 through 10, (assigned when the file

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was OPENed), in the output statements; or by giving a statement specifying through which channel all output is to be routed, such as:

```
20 OUTPUT # 1
30 PRINT A
```

or

```
20 PRINT # 10, A
```

In DESKTOP/PLAN, I used five drivers:

1. .PRINTER
2. .CONSOLE
3. .GRAFIX
4. .SILENTYPE
5. .D1 and .D2 (the diskettes).

All of my application code is totally independent of the device being used for input or output, and is very straightforward.

File handling was further eased by an easy "End of File" capability. All that is necessary is a statement like

```
10 ON EOF GOTO 100
```

after the file is opened but before the INPUT or READ statements.

As new, bigger, better performing devices become available (*Like those hard disk drives we keep hearing rumors about, Don?—PCW*) users can incorporate these into their use of DESKTOP PLAN ///, by including the drivers for these devices into the SOS.DRIVER file. This is very easily done using the System Configuration Program utility provided by Apple.

Two more features of SOS really made development of DESKTOP PLAN /// simple: the "Memory Manager", and the INVOKEable module feature, which work together. An INVOKEable module, of which you may have heard, is nothing more than a machine language subroutine which may be loaded and used during execution of a BASIC program. That means that portions of a system which are better programmed in Assembly language for reasons of performance or memory space, can be easily incorporated.

I used two INVOKEable modules (both provided by Apple):

```
BGRAF.INV ,and
PSCREEN
```

BGRAF.INV provides a series of functions to perform high speed graphics output to the .GRAFIX driver. For instance, to turn graphics on, color the screen background light blue, and draw a red line from the lower left to upper right, is this simple:

```
10 OPEN # 1, ".GRAFIX" :
  REM Turn on graphics
  driver
20 INVOKE "BGRAF.INV" :
  REM Load BGRAF.INV
50 PERFORM GRAFIXMODE
  (%1) : REM Set to
  280 x 192
60 PERFORM FILLCOLOR
  (%7) : REM Background
  color
70 PERFORM PENCOLOR
  (%3) : REM Line color
80 PERFORM GRAFIXON :
  REM Turn on graphics
  screen
90 PERFORM FILLPORT :
  REM Put in background
100 PERFORM LINETO
  (%191,%289) : REM Draw
  line
```

Notice that the programmer loaded the graphics commands with no concern for where in memory it was to go. The SOS "Memory Manager" took care of that. Yet, the programmer is able to use any machine language modules, such as drivers or INVOKEable modules with no consideration for where in memory they are to be placed or reside at execution time.

PSCREEN provides several PERFORM functions to print graphics and text screens to the Silentype printer in the same manner.

DESKTOP/PLAN includes a comprehensive "report generator" capability. To test this is very time consuming, but I was able to speed this up considerably by substituting .CONSOLE for .PRINTER while testing.

One last feature helped immensely in debugging and changing program statements. The console driver provides a facility for moving the cursor through whatever is dis-

played on the screen, either in "cursor move" mode, or in "copy" mode. ESC puts you into "cursor move" mode, and the "arrow" keys let you move the cursor anywhere. (A "+" appears in the cursor.) Pressing any other key puts you into "copy" mode, for editing. It's like the "ESC IJKM" feature on the Apple II, but cleaner and faster.

Well, enough of the good stuff. What was wrong?

There were a few features missing. I really would have liked to have had a RENUMBER/MERGE capability. And a general purpose file utility like FID on the Apple II, would have been useful. I'm told, though, that these functions are coming.

Yes, there were a few bugs, but nothing catastrophic. And once I found them I was able to work around them.

However, considering the magnitude of Business BASIC, SOS, the INVOKEable modules, and the SOS.DRIVERS, I found the system amazingly "clean".

Frankly, I had a ball developing DESKTOP PLAN ///, and I know there are others who are having just as good a time getting their software up on the Apple ///.



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See page 95



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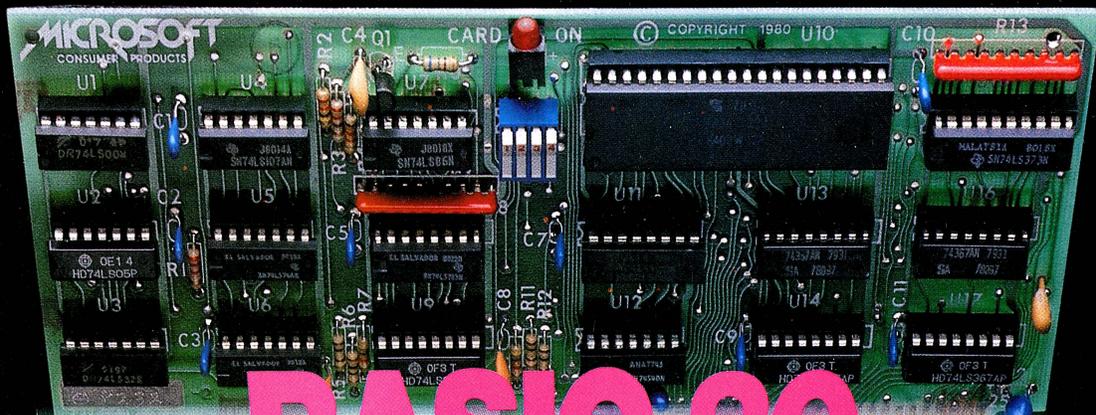
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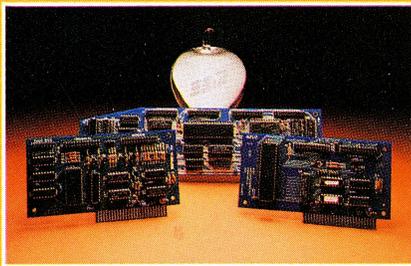
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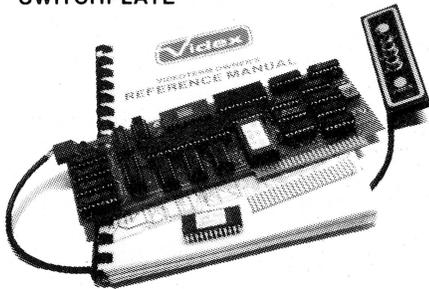
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VIDEOTERM's on-board asynchronous crystal clock ensures flicker-free character display. Only the size of the Pascal Language card, VIDEOTERM utilizes CMOS and low power consumption ICs, ensuring cool, reliable operation. All ICs are fully socketed for easy maintenance. Add to that 2K of on-board RAM, 50 or 60 Hz operation, and provision of power and input connectors for a light pen. Problems are designed out, not in.

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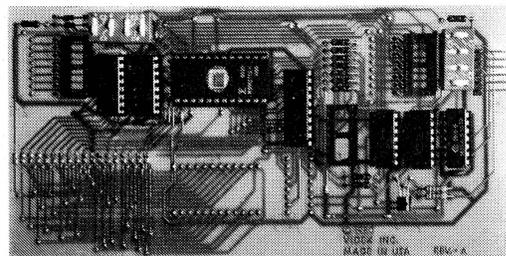
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APPLE vs. BABY BLUE: Can IBM Get Personal?

by Joe Budge

When IBM introduced a personal computer in August, many pundits predicted the quick death of the other microcomputer companies. The IBM Personal Computer was acclaimed as "totally revolutionary", "a new marvel", and generally the best invention since the electric ice cream maker. Closer investigation reveals that the source of all this information was, naturally, IBM. None of the new machines were available until early October for real "hands-on" testing. More importantly, no one looked past the marketing hype to see what the IBM machine could actually do. In microcomputing, it's not uncommon for a substantial gap to appear between a manufacturer's claims and the actual product. Here, then, is an attempt to cut through the salesman's breeze and take a close look at the IBM Personal Computer, to see how it compares with Apple's current line.

What Can It Do?

Personal computer buyers are interested in function, not hardware or software design. The most important question for the buyer is "What can it do for *me*?" This question is answered by the functions of the software available for the system. In the trade, this is called "applications software". IBM is offering communications software, VisiCalc, Easywriter, accounting software, and an Adventure game.

Everyone should know what VisiCalc is by now. Originally written for the Apple, it's currently available on almost every make of microcomputer. It is pretty much the same from system to system. Easywriter is a word processor. This too was originally for the Apple II, and a Professional Easywriter version is also available. The accounting software provides General Ledger, Accounts

Payable, and Accounts Receivable. These software packages are adaptation of the Z-80 based Peachtree software written for CP/M systems (Apple owners with a Z-80 Softcard can use the same stuff). In terms of capabilities and user friendliness, the software falls in the mid range of similar accounting software available for the Apples. Adventure was originally written at MIT in the 1950's, and has since been adapted to every computer with disk storage. The communications software allows the IBM system to talk with other computers directly or through modems. There are at least a half-dozen programs which do the same thing or more for the Apple II (e.g., BITS, ASCII Express, VisiTerm, and Micro Courier).

What is apparent is that while the IBM Personal Computer obviously comes from a good home, it brings absolutely nothing "revolutionary" to personal computer users. All of its applications software has either been translated from Apple-based software, or is nearly identical to it. An important point to note about application software is diversity. Here are five major software packages available for the IBM, while there are more than 1,500 available for the Apple II. The more software, the more likely a user can find the "right" package for him or herself, on the shelf.

That diversity, by the way, is not to be sneezed at, because it reflects personal preferences. There are some folks out there who don't like Easywriter. (*Shocking!!—PCW*) There are 15 or so other word processors available for the Apple II, and a half dozen for the III, to meet those tastes. With IBM, one choice, so far.

That diversity is likely to be a long time coming. Professional software development takes about one year per application package. This situa-

tion is best summed up in the words of an IBM salesman: "IBM is three to five years behind Apple in software development."

That's partially because Apple The Company hasn't been the only one developing software. Many other companies have sprung up to fill market gap of all sizes and shapes, spurred on by an existing customer base in excess of a quarter of a million Apples out there already, and unofficial estimates of at least 20,000 joining the group each month.

And the customers have banded together into User Groups (which make up the IAC). These independent (*Very independent!—PWC*) groups have themselves spawned literally hundreds of non-commercial (and some ultimately commercial) programs and applications. They have also spawned Apple-related *people*, which is the key to any industry. It is probably not unfair to say that the "Apple Phenomenon" has been fueled as much or more by people who are not on the Apple payroll as by those who are with the company.

Hardware Features

Comparing hardware features between systems is a slippery task. Quite different hardware configurations can wind up serving the same function. By contrast, quite minor changes at times can yield drastically different system capabilities. The object of hardware comparison is to provide the sophisticated programmer with an idea of what he might be able to teach the system to do, and to provide the novice with an idea of what direction the system might grow in the future. Because of this, and because of the vast diversity of individual interests, it is impossible to evaluate the systems in

terms of "better", or "best".

Every microcomputer today lives and breathes because of a single thinking chip called the microprocessor. IBM has chosen the Intel 8088 model chip for their computer. Apple uses the Synertek 6502 chip for the Apple II, and the faster 6502B for the Apple III. Another common chip, the Zilog Z-80, is used in most CP/M systems, notably Radio Shack's and Xerox's. None of these chips are electrically interchangeable with the others. Both the 6502 and 8088 are superior to the Z-80 in terms of processing speed and efficient memory usage. In one of their ads, IBM published a table comparing the 8088 to the Z-80. The 8088 was equal in speed to the Z-80 on some tasks, and up to nine times faster on others.

Because of a different processing system, the 6502 averages four times faster than the Z-80 when run at the same computer clock speed (oddly enough, IBM left a comparison with the 6502 out of their ad). From this it can be estimated the IBM will be about as fast as the Apple III in processing machine language instructions, and twice as fast as the II. There may be considerable leeway here, for the memory access time of the Apple II is faster than the cycle time of the IBM Personal Computer (200 nsec vs. 250 nsec).

Memory capacity of the three systems shows the greatest variation. The Apple II is designed to access 64K of Random Access Memory (RAM). Various manufacturers produce cards which can add on another 16K, 32K, or 64K, and, it is rumored, 128K soon, for a total of 192K. While IBM advertises that their machine can handle 256K, currently available system configurations can hold no

more than 192K (see slots, below). The Apple III now comes with 128K as standard, with rumors of 256K expansion just around the corner. Eventually it should be able to handle 512K, as Alan Anderson pointed out in the September *Apple Orchard*.

The different memory sizes require a trade-off in efficiency of memory use. 64K machines like the Apple II can specify all of memory with two bytes of information (\$FFF) in addition to the instruction itself. The IBM machine requires three additional bytes, which means that for programs that could fit on either system, the IBM would require about 25 per cent more memory. In short, even if the capacity were greater, the IBM machine uses more memory to do the same thing. (See what I meant about hardware comparisons being slippery?) The Apple III uses bank switching, and so it falls somewhere between the Apple II and the IBM.

Facilities for system expansion are always important in a microcomputer. Many extra functions can be added via interface cards, either at the time of purchase, or some time after. Both Apple's machines and the IBM allow for expansion by providing card slots on the main computer board. The IBM computer has five slots. In the only two configurations in which the system is sold, three of these slots must be occupied by interfaces for a printer, disk drive, and video interface (that's right, sports fans, the video interface is not built in). That leaves two slots for everything else, including any memory expansion, communications, game controls, etc.

The Apple II has eight slots (most of which fill up), and separate video and game outputs. So after taking

care of video, disk and printer, there are six slots left open. The Apple III has four slots, all of which can remain open because of the built-in video, printer interface, and disk drive.

What About Price?

The IBM Personal Computer can be compared to both the Apple II and Apple III in terms of price and performance. For the price comparison, please keep in mind that prices do change; these might not be quite right when you read this magazine.

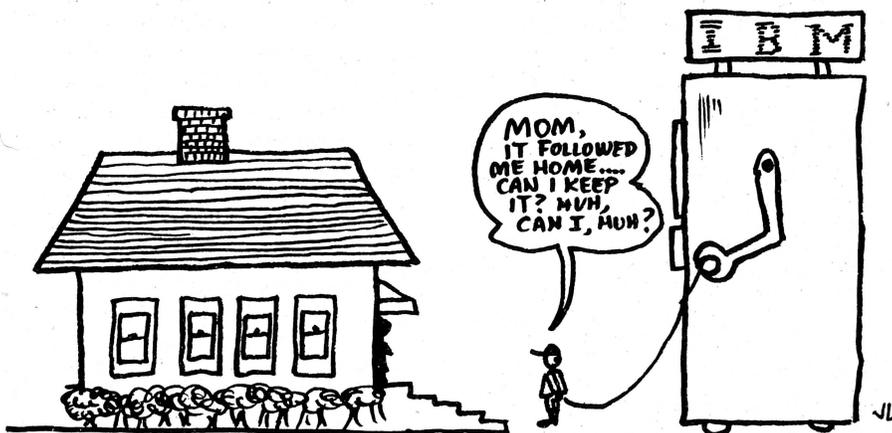
IBM advertises their Personal Computer for as little as \$1595. This represents the "stripped-down" 16K system which, lacking video output, is non-functional. It is also potentially misleading, as the smallest system they will sell includes 48K of memory, a disk drive, and a serial printer interface card. To be functional, the system also needs system software (DOS) and a video interface card. To be comparable to the Apple II, one should also add a Game Control Adapter (\$55). This combination carries a suggested retail price of \$2815. A comparably equipped Apple II Plus has a suggested retail price of \$2370.

The typical configuration of the Apple III is the Information Analyst. This includes 128K of RAM, color graphics capability, BASIC, VisiCalc III, one built-in disk drive, and a 12-inch black and white monitor. The suggested retail price of the system is \$4190. A comparably equipped IBM Personal Computer, including software, has a suggested retail price of \$4290. This is going to be interesting!

Conclusion

This brief review can't begin to cover all of the nuances, distinctions, and possibilities of the three systems. All support BASIC and Pascal. All have built-in speakers. The IBM's video is comparable to the Apple III, both having twice the resolution of the Apple II. Same for keyboards; the IBM's is more like the III's than the II's.

It's clear that IBM hasn't introduced anything "revolutionary", but they'll no doubt keep saying so. What they have introduced is an interesting alternative. For closer comparison, why don't you go down to a computer dealer and try the "Apple vs. Baby Blue" test for yourself? (Yes, and let us know what you think after you do.—PCW)



USER GROUP FORUM

by Randy Fields
 Chairman, Users' Group Committee
 Past President, San Francisco Apple Core

QUESTIONS AND ANSWERS WITH SOME TIPS

NOTE: The International Apple Core (IAC) receives many requests for information about starting and running Apple Users' Groups. I've asked Randy Fields to conduct this column to discuss many facets of Club activities in a practical way. Randy is Past President of the San Francisco Apple Core, and is the IAC's New Club Assistance Chairman. His sometimes painfully-won background in club policies, procedures, and practices is here for all of us; write if you have questions about Club matters.

—PCW

"INIT' USER GROUP" manual

The International Apple Core is proud to present the "INIT' USER GROUP" manual which covers many aspects of starting a new Apple users group. Topics discussed are: the International Apple Core, how to start a new club, where and when to meet, club newsletter and other publications—generically known as hardcopy, setting up a software library of member-developed software, sample constitutions and bylaws, plus samples of newsletters and a selection of IAC software.

The INIT USER GROUP manual is only available to IAC member clubs,

and not, to individuals. The price is a surprising low \$25.00. From time to time, sections will be updated or written entirely from scratch. Also, the IAC plans to publish additional manuals on club operations, etc.

Qs & As + Ts, or maybe Qs + (Ts & As)

QUESTION from Terry McCombs of the Plane Apple Club, P.O. Box 12013, Wichita, Ks. 67277:

If you have any secrets for increasing the worker core group, please address it. . .

ANSWER:

The biggest non-secret to increasing the number of active volunteers is to ASK them to volunteer. During your meetings of your officers and currently active volunteers, a list of additional activities or further divisions of responsibilities should be drawn up. Organize this list into logical categories, assign one or more titles (reflecting the job descriptions) such as: Vice President for Demonstration Coordination, and have the President present it at your General meeting. Naturally, the presentation should be as stimulating as possible.

Also, the active volunteers should be rewarded for their contributions. The San Francisco Apple Core gives a free annual membership for the

previous year's service, and also, a free Disk of the Month (DOM) for articles published in the newsletter, software submissions to the DOM, etc. These are but a few of the rewards. Your membership dues should include a component for paying for the rewards.

A "TIP from Randy"

Once you have set the date, time and location of your General meeting ("second Wednesday of each month at the . . ."), do not change it without at least 3 months notice to your members, computer stores, etc. Nothing bugs a member more than a blown meeting. Look at a calendar for holidays, and try to find out when "computer fairs" and swap meets are going to be held. Schedule around them.

A "TIP from Nick":

Nick Guckert, President of the Juneau (Alaska) Computer Users Group, said that "the group as a whole has come up with some excellent suggestions as to what our goals could be and what we want out of the group. Some of the suggestions have been: community service, i.e., computer assistance to the handicapped and computerization of our local libraries; cross breeding programs between the different computers in the group; communications to the south 48 via cable TV and satellite for the Source and Micronet (too expensive at present); ethics of program swapping, etc."

A Comment on Nick's Tip:

Apples and other microcomputers are "hot stuff"! There has been considerable media attention to the "computer revolution." Your President or designated "media coordinator" can contact local TV and radio stations, newspapers, etc. to report on a club meeting. Naturally, try to have some interesting demos of both commercial and member-developed software. Games are always popular, but can increase the perception that "Apples" are \$1,500+ toys. Well designed VisiCalc templates can demonstrate the use of microcomputers in business. Even the "Lemonade" game (actually, a rather good business simulation model) on the DOS 3.3 Master can be effectively used to show the graphics and sound capabilities of the Apple. "Reach out and Touch" potential members with the media and effective demos as your allies.

QUESTION from Paul Maddock of HAAUG:

"Help! What do you guys do? Is there any organized fund raising activity you engage in, and with what success?"

Paul's letter starts with "As the HAAUG (Houston Area Apple User Group) down here in Houston crosses 400, its executive committee is busily plotting a future of expanded services to its members. Trouble is, such futures cost money. A slick paper newsletter, large screen video display, phone answering equipment, and permanent physical location are all attractive but expensive.

And, sad to say, it appears that our \$18 annual membership fee doesn't go farther than to cover our expenses.

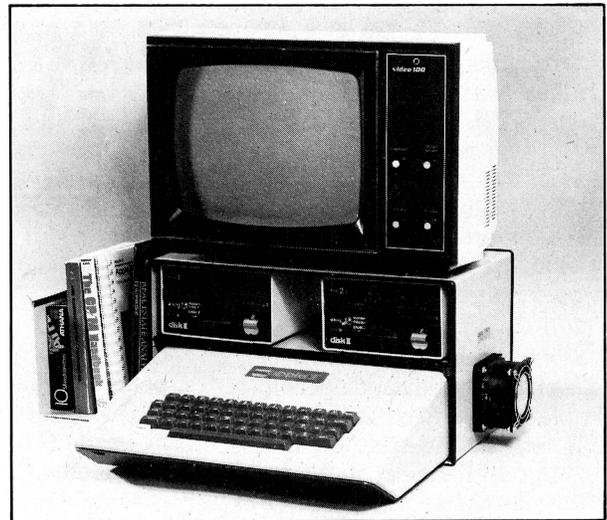
ANSWER:

Classical "Fund Raising" (soliciting donations from members, and especially, non-members) depends on the legal status of your club, and also, the wording of your constitution and bylaws. Check with your club (or outside) attorney before trying this approach to increasing the club treasury.

(continued on page 96)

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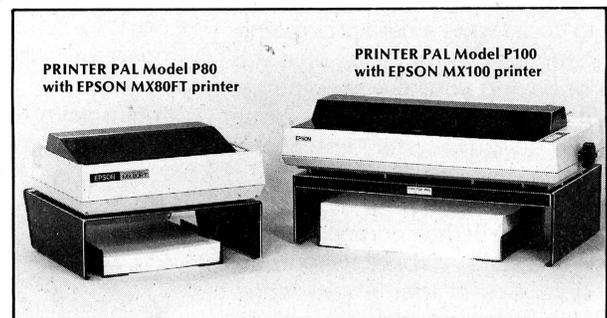


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PAYROLL WITH AN IN-HOUSE APPLE II COMPUTER

A REVIEW OF FOUR SOFTWARE PACKAGES

The computerization of payroll is a necessity in this day and age. More and more reports need to be sent to various federal and state agencies, and to support financial statements. Given the increasing complexity of "adds and deducts" from a wage, the process of preparing payroll accounts, checks, and the variety of reports mentioned above, is likely to be consuming more and more of a small business' administrative resources (a fancy way of saying it's becoming more of a pain as the business grows). The speed with which these recurring reports can be prepared on a computer is invaluable, and the advantage of detailed record keeping makes internal paper management simpler.

One approach is to hire a "computing company", a data processing service. These firms sell against the idea of having your own computer; they'll do it all. Well, not really. Your payroll person will still "enter" the necessary data, on the company's forms, and in their format. They'll enter the data in their computer, process it, and send you back the output. The drawback is that it gets done their way, on their schedule; you lose flexibility.

O.K., so no system is worry-free. And for a company with fewer than 10 employees, it's frankly just as easy to handle the payroll process manually. If you expect near-term growth to more than ten employees, however, you may want to prepare for that growth by installing a system, in advance of actual need.

There are a few payroll software packages on the market which will allow you to use an in-house Apple II computer to make up the payroll. We contacted a number of manufacturers; four thought enough of you to respond, and we present here evalua-

tions done by a professional payroll person. The following programs are all good, but each one satisfies specific needs. (The beauty of the Apple is that such a variety is available.)

Regardless, there must be someone familiar with payroll and the related reports, either to operate or to supervise the system; no computer system can replace human knowledge. It is possible to operate some systems without prior knowledge, but the operator might not recognize say, an input error, which could then be carried on through report after report, indefinitely. Any system, in or out of house can assist a human being, but not replace a human being. Some systems help more than others, however. In selecting a program to use, it's important to define work force, the skills of the payroll operator, and the company's requirements. Choose carefully and make payroll one of the more pleasant bookkeeping tasks.

1. PASCAL SOFTWARE PAYROLL SYSTEM

by Broderbund Software
#2 Vista Wood Way
San Rafael, CA 94901
415-456-6424

Although a perfect program has never been written, here is at least a very good one. It will handle one to 300 employees per year with a limitation of 245 per pay period. This can be expanded and instructions to do so are included.

This is not a program for a payroll of fewer than 20 employees. Because it is written in Pascal it is faster than those written in BASIC. It is extremely comprehensive and has capabilities that some smaller users won't need. It does require an Apple II

or Apple II Plus with 48K of memory, two or more disk drives formatted for DOS 3.3 and a printer. The printer can be any capable of at least 96 columns. The Epson MX-80 and the Centronics 737 are both specifically compatible with the system.

Five disks are shipped with the package. Numbers 1 and 2 are the payroll program, number 3 is the computing program, 4 is data and 5 is the address file. The system can compute all state and federal deductions, allows for city taxes, and has more than enough capacity for other deductions. It seems it would be difficult for a company to exceed its capacity under normal circumstances.

The program is set up so that one employee can, in any one pay period, be paid in more than one mode. This could perhaps be hourly plus bonus, hourly plus commission or both; another possibility is more than one hourly rate. This feature would be appreciated by farmers, various manufacturers, job shops, etc., who pay employees by various rates according to the job being performed. Employees can be grouped by divisions too, in any way one desires.

Another feature that might seem redundant, but could be very helpful is the ability to print the Detail Listing before running the payroll. This gives you the ability to spot errors before they are updated to the Master-file. Granted you should have seen errors on the screen, but many times they are missed. This is a good safeguard and is not mandatory.

The system has many safeguards throughout. If an operator follows all instructions to the letter, there should be no problems when the payroll is finished. This brings us to the instructions.

Instructions are well written and well arranged. It is at times difficult for one who is familiar with both computer and payroll systems to determine how an operator with no experience would fare in a program like this. This writer feels that an inexperienced operator would certainly have some problems with the system. It would be better if someone either familiar with manual payroll systems or one who has used computers in some way would be employed. An understanding of payroll deductions is not absolutely necessary but would be helpful. Of course this is true with most systems. Too many people think a computer system is the answer to inexperienced employees—this is rarely true. This system would be most efficient with someone thoroughly familiar with all phases of payroll and some prior experience with a computer system.

The system will generate quarterly reports, year-end reports, W-2 forms, and has many options for summary reports. It can report all employees by location, pay elements by location, employees by ethnic distribution, and more.

The biggest problem that was found with the system is the inability to update the tax computing system.

This is done yearly or when necessary, by the manufacturer. This could be a problem if new disks are not prompt. This also limits the ability to override the tax tables. It does not seem possible to deduct more than the tax table dictates, and many employees like to do this.

This is a professionally designed, well written and formatted system. It has some drawbacks as noted, but nothing serious. It doesn't require constant reference to the manual, and is satisfactory within the parameters noted.

2. CONTINENTAL SOFTWARE PAYROLL SYSTEM

by Continental Software
12101 Jefferson Blvd.
Culver City, CA 90230

This is a program that the writers say is "a truly revolutionary payroll program." What is revolutionary is not immediately apparent. Perhaps something this writer considers basic is considered "revolutionary" by those who wrote the system. (*A bit of "verbal inflation" common to computer industry people; "revolutionary" means "we changed it a bit".—PCW*).

This system is fairly simple to operate. Personnel records, federal and state information are stored well and easily retrieved. The user has the ability to change all tax rates and to override tax deductions when necessary. This is a nice feature in a small system. The voluntary deductions will be taken out only if the check includes some "regular pay".

This package requires an Apple II with 48K, two disk drives with DOS 3.3; and if you don't have an Apple II Plus it requires Applesoft in ROM or a language card. It also requires a printer capable of 132 columns. The program is on one disk and the user adds two blank disks—one for employees and other for transactions.

The system generates all reports required including W-2's, year end, and quarterly. The reports are easy to read and audit trails are good.

One disadvantage includes the fact the system was designed to be used with Continental General Ledger System. It therefore is necessarily limited and bound to their account numbers. This probably is not extreme and might be able to be changed.

The instruction manual is written in a step by step format and seems easy to follow. As with all systems, a working knowledge of manual payroll would be most helpful.

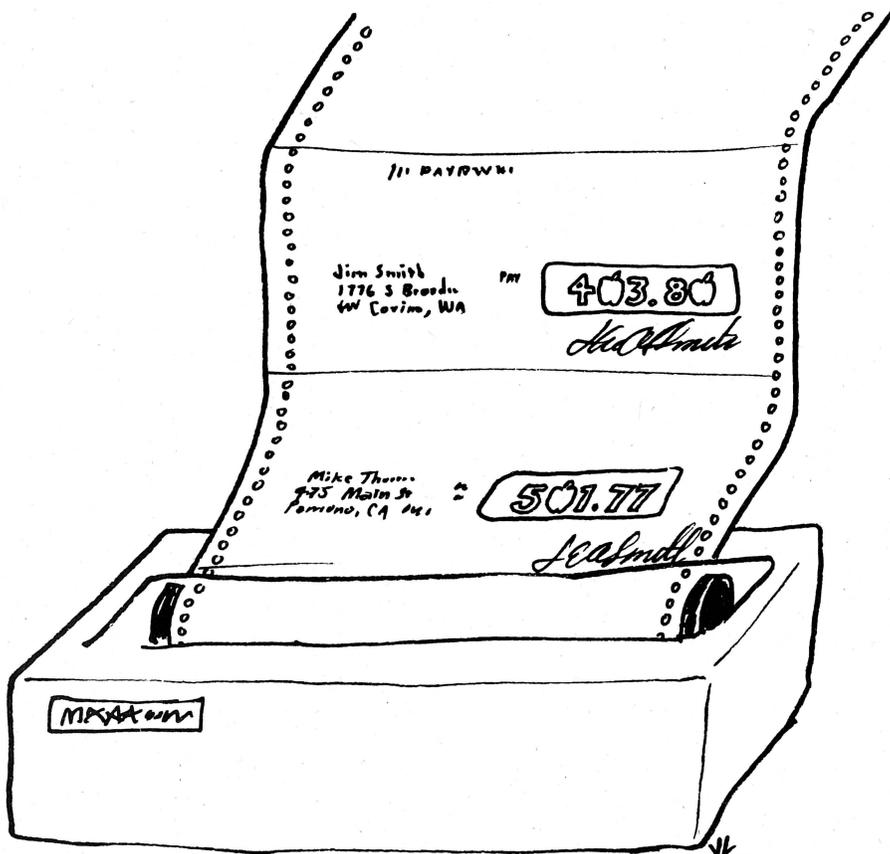
3. MICROPAYROLL SYSTEM Version 6.0

by Alternative Software, Inc.
Address: 1165 Barbara Drive
City: Cherry Hill, NJ 08003
Phone: (609) 488-1144

This system comes with three versions. One for DOS 3.3 dual disk drive, another for DOS 3.3 single drive, and the last for DOS 3.2.1 dual drive. It requires an Apple II Plus with 48K and a printer. It was designed to be used with a Centronics-type but may be adapted for use with other printers.

The system can handle up to 145 employees on the dual drive 3.3 setup, but this figure is not exact because some trade-offs can be made to increase or decrease that number.

The instructions in the manual are extremely comprehensive and easily understood. The inexperienced payroll clerk should have little trouble operating it with a minimum of



supervision. Of course some things, such as updating the tax tables, should be handled by someone with supervisory capabilities. As usual, what we are saying is that there must be someone with a good payroll background to handle some of the operations.

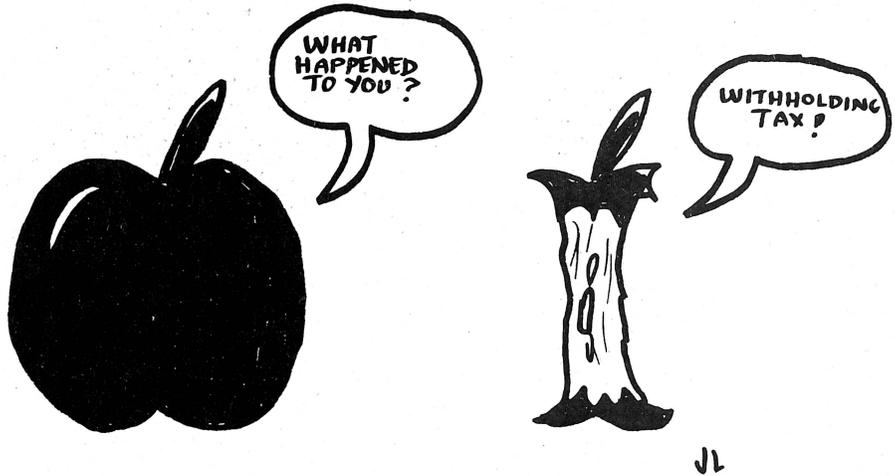
All necessary payroll data is produced and printed; seniority list, time card data entry, master payroll list, paychecks, quarterly tax reports, year to date, W-2 master listing and W-2 slips.

The program has the capability of paying an employee in one or more modes which is an excellent feature. Also, the capability exists of overriding the tax deduction functions. Safeguards are excellent throughout the program.

Blessing of blessings! The instructions in the manual list "known system limitations" and "enhanced use of the Micropayroll System". As far as this writer is concerned, all manuals should have a similar section. Actual examples of problems people have had, and their solutions, are presented.

Although this program may not be too fast and size is limited it is a very good program. It is especially good for the small payroll user. The format is excellent and the manual exceedingly well written. I highly recommend it.

(We have heard about, but have not seen, Version 6.3 which is said to correct a local tax table problem, be faster, and better. We'll pass along the word on this updated version when we receive it.—PCW)



4. PAYROLL SYSTEM, Version 1.8
by BPI Systems, Inc.

1600 W 38th St, Suite 444
Austin, TX 78731

Finally, a program that can be interfaced with an existing job cost system! Although there are some undesirable limitations to this "Cadillac" of programs, this job cost feature is a real plus. We all know many accountants frown on job cost systems, but there is a wide need for just this feature. It is a program that is limited to numbers of employees only by the number of data disks one wishes to use. Each disk has a capacity of 100 employees.

The program requires an Apple II Plus with 48K, two disk drives with DOS 3.3 and a printer capable of a minimum of 80 columns. The system is made to interface with BPI's General Ledger System and its job cost system.

One of the minuses for this program is the inability to copy any of the four disks supplied. This means a purchase of at least one duplicate set at a cost of \$40.00. Also, the tax computation disk must be purchased each year, only if there are changes, and this is an additional cost. A firm with few employees might find these disadvantages outweigh the advantages. On the other hand, a firm with 100 employees might be more than justified in using this system if they need and use the job cost interface.

The program is capable of paying an employee in more than one mode per check. Perhaps one would pay two hourly rates plus commission. Differing pay periods may not be mixed. All employees on one type of pay period must be processed before going to the next type of pay period.

Safeguards used for access to information are good. A unique feature, for a mini-system, is the ability to enter multiple commands in a queue for automatic execution. This could be a nice time-saver. This program does not allow for an automatic override of the federal and state withholding taxes, therefore additional taxes could not be taken out if requested. This could be handled as a separate deduction, but it would be tedious. A good feature would be the ability to add a flat or percentage rate to these two items.

It will print a complete set of Payroll Reports with a minimum of effort on the part of the operator. It is comprehensive and extensive. It also is expensive to buy and maintain (updates, etc.). It can be recommended for the company with many employees or a need to use payroll with a job cost system.

PAYROLL SYSTEMS COMPARISON CHART

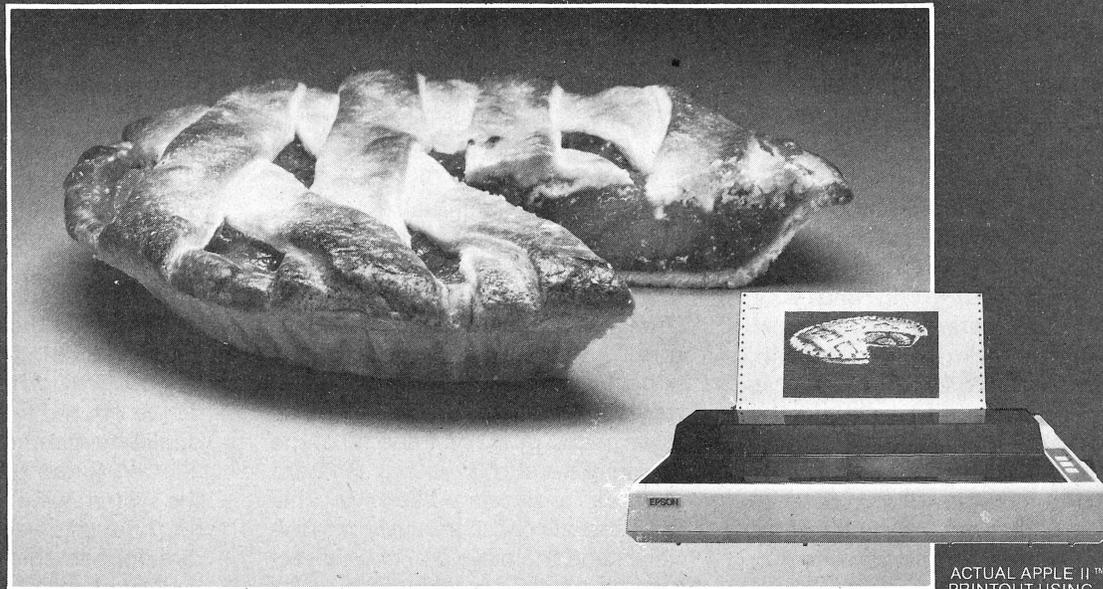
	1	2	3	4
Interfaces to general ledger system	No	Yes	No	Yes
Factory update of tax tables required	Yes	No	No	Yes
Ease of obtaining reports	Ex	Ex	Ex	Ex
Safeguards for data protection	G	G	G	G
Maximum # of employees on system (per disk)	245+	100	145	100
State tax tables in system	Yes	Yes	Yes	Yes
Menu formatting	G	G	Ex	G
Job Costing interface	No	No	No	Yes
Documentation (manual)	G	Ex	Ex	G
Copyable	Yes	Yes	Yes	No
Override on tax tables	No	Yes	Yes	No
Price (suggested)	\$395	\$250	\$349	\$295

It is recommended that all programs be used by persons familiar with payroll requirements.



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WORKS WITH PASCAL & CPM



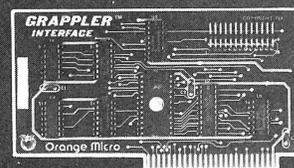
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BACKING UP DIRECTORIES

or

"I NEVER SMOKE BETWEEN CIGARETTES!"

by Dr. Wo

Somehow it happens. You're working on a program, or with a program on some important data. Something goes wrong and your disk directory gets wiped out! What can you do?

One excellent form of insurance is to back up diskettes—frequently! But of course you can only back up diskettes after program execution—which reminds me of my favorite nicotine addict, who proudly notes that he never smokes between cigarettes.

Our problem here is to try to develop some method of recovering from directory crashes which occur between disk backup operations. Fortunately, we can lay most of the work on the operating system. Here's how to do it:

The system maintains a diskette's directory on blocks two through five inclusive. Each time a file is changed, the operating system updates the directory to reflect the changes. Indeed, the directory is the system's sole source of information when it comes to determining what is on a diskette, and some file changes are in reality only directory changes. For example, when a file is removed using the 'R(emove) command in the system Filer it is only the directory entry for the file which is removed; no other changes are made to the diskette. If the 'R(emove) command is immediately followed by a (carefully chosen series of) 'M(ake) command(s), the presumably deleted file can be completely restored. (What is a "carefully chosen series"? More on that some other time.)

The directory is initialized when a diskette is formatted and when the 'Z(ero) command in the system Filer is executed. One of the questions 'Z(ero) asks is "Duplicate Directory?", meaning, "Do you want the system to maintain a duplicate directory on the diskette?" Contrary to the information given on Page 50 of the Apple Pascal Operating System Manual, answering "Yes" to this question will cause the system to initialize and maintain a backup directory on blocks six through nine inclusive, subsequently updating it each time it updates the primary directory.

Let us illustrate how the duplicate directory helps to protect us: Suppose we initiate a file writing operation from within a program. The system checks the directory to find out where there is disk space for the file. It then writes to the disk file. After the file is written, the system first updates the primary directory, and then updates the duplicate directory, if one exists. If the file writing operation fails, the directory(s) never get updated. If the system crashes while writing the file or while updating the primary directory, it is unlikely (we hope) that both the primary and the duplicate directories will be destroyed. And if the primary directory does get wiped out, we can hope to recover by substituting the duplicate directory for the primary.

So, by storing a redundant directory, at the low, low cost of four blocks of diskette storage, we wager that whatever disasters may befall a diskette's primary directory will not

also simultaneously wipe out the duplicate. Like any bet, we will lose sometimes; but the price is low and the stakes can be high.

Assuming that we have lost our primary directory, how can we tell whether we won the bet? That is, how do we get the information from the duplicate directory into the space allotted to the primary directory so the system will use it? For that matter, how can we set up a duplicate directory on a diskette which already has data on it? The answers to these questions are given in the form of the program 'COPY_DUP_DIR' and 'MARK_DUP_DIR', and the unit 'DIR_OPS' listed below. To get started, we need to look at the declarations for the Apple Pascal directory.

Directory Declarations and Unit DIR_OPS

The declarations for an Apple Pascal diskette directory given below were published by Apple. Some additions have been made by me for this article.

As we see, a diskette directory is an array of 78 entries (0 to 77) of type 'direntry'. Each entry is a variant record tagged by the field "dfkind" of type 'filekind'. The 'zeroeth' entry of the array is used to store volume information, and is the only one, in practice, which is tagged with the values 'untypedfile' and 'securedir'. The remaining entries describe the files on the diskette and are tagged by the other values of 'dfkind'.

The volume entry contains the name of the volume 'dvid' (for example, APPLE1); the number of blocks

on the volume (280 for an Apple floppy); the number of active file entries up to `maxdir=77`; and some time and date information which is affected by certain operations such as changing the date from the Filer. There are also 13 bits of information, 'filler1', for expansion or other unspecified purposes.

The file entries contain 12 bits of unused data, 'filler2'; a BOOLEAN flag 'status' which is used by the system Filer to flag files specified by wild cards; the name of the file, 'dtid' (for example, MYPROG.TEXT); the number of bytes of valid data in the last block of the file; and some information which is updated by the system when the file is modified, as by editing.

Note that there are nine different filekinds. The value 'untypedfile' is usually used to tag the volume (zeroeth) entry of the directory. The value 'xdsfile' is used to tag the directory entries corresponding to bad blocks on disk. The values 'codefile', 'textfile', and 'datafile' are associated with code, text and user-produced data files. The value 'infofile' is associated with compiler listing files produced using the '\$L' compiler option.

The values 'graffile' and 'fotofile' are associated with files which have the suffixes .GRAF and .FOTO, respectively, and might well be used by the programmer to distinguish graphics images on disk.

Curious though it is, the values of 'dfkind' are apparently used only to tag the variants of a directory entry, and have little to do with the way the system treats files. The overriding consideration in the way the system uses a file is the file name suffix. For example, only a file whose name ends in .TEXT can be edited by the system editor and then it makes no difference what the value of 'dfkind' for the file is!

Fields common to all directory entries, including the zeroeth, are 'dfkind', which tags the variants, and 'dfirstblk' and 'dlastblk'. In the case of a file entry, 'dfirstblk' is the disk address of the first block of the file and 'dlastblk' is the address of the first block following the file where file blocks are allocated contiguously. Thus, (dlastblk—dfirstblk) is the block length of the file.

In the case of the zeroeth entry, 'dfirstblk' will always be 0, the beginning of the disk, while 'dlastblk' will

be either 10 or 6, depending on whether there is or is not a duplicate directory on disk. We will see momentarily how we use 'dlastblk' to establish a duplicate directory.

The remainder of Unit DIR__OPS consists of six functions of the same general form which perform basic Read and Write operations on directories.

The function 'GET__DIR' attempts to read the primary directory from the physical unit numbered 'UNIT__NUM'. If successful (namely, the built-in function 'IORESULT' returns 0) the directory is returned in 'dir', 'IOERROR' returns as 0 and 'GET__DIR' becomes TRUE. If not successful, 'dir' is undefined, 'IOERROR' returns a non-zero value which diagnoses the failure, and 'GET__DIR' returns FALSE. Please refer to Table 2, Page 133 of your Apple Pascal Language manual for the meaning of non-zero values of 'IOERROR'.

The function 'GET__DUP__DIR' attempts to read a duplicate directory but is otherwise identical to 'GET__DIR' with respect to the values it returns. Note however, that the function pays no attention to whether the duplicate directory actually exists; it simply reads the disk blocks where the duplicate is supposed to be. Therefore, it is possible for 'GET__DUP__DIR' to return TRUE even when no duplicate directory exists. In such cases 'dir' contains whatever information happened to be stored on disk blocks six to nine inclusive.

The function 'MARKED' is provided to check whether a duplicate directory exists, and should normally precede calls to 'GET__DUP__DIR'. If a duplicate exists, the function 'MARKED' returns TRUE, and the volume entry of the primary directory in 'volinfo'; if not, or if an I/O error is committed, the function returns FALSE.

'MARKED' inspects the value of 'dlastblk' in the zeroeth entry of the primary directory. If this value is 10 (=maxdirblk), there is a duplicate directory. 'MARKED' calls 'GET__VOL__INFO', which is also in the interface of the unit. 'GET__VOL__INFO' attempts to Read the volume entry of the primary directory on the specified unit. If successful, it returns TRUE with the entry in 'volinfo'.

Writing directories and duplicates is accomplished by 'PUT__DIR' and 'PUT__DUP__DIR'. 'PUT__DUP__

DIR' writes a duplicate directory to disk blocks 6 through 9 inclusive. Note that it does no checking to see whether these blocks are free! It is the user's responsibility to make sure that data is not destroyed. The program 'MARK__DUP__DIR' given below shows how to do this.

The directory read/write functions call on the functions 'DIR__PUT' and 'DIR__GET' in the implementation section of 'DIR__OPS'. 'DIR__PUT' requires one more parameter than either of the other two directory writing routines, namely the disk block at which Writing is to start. This is similar for 'DIR__GET'.

Establishing Duplicate Directories

Establishing a backup directory on a fresh diskette is easy: use the Z(ero) command in the Filer and answer 'yes' to the question about duplicate directories.

Establishing backup directories for old diskettes is a little more work. One way is to transfer files from an old disk to a new one with a duplicate directory. Remember not to do a volume transfer! A whole volume transfer destroys all information on the destination diskette, including any knowledge of duplicate directories.

A second method of establishing backup directories on old diskettes is to use the program 'MARK__DUP__DIR'. First you must arrange the files on the target disk so that blocks 6 through 9 are unused. If you cannot do this (that is, if there are not four free blocks anywhere on the disk), you will have to remove one or more files to liberate four blocks.

'MARK__DUP__DIR' starts off by eliciting the unit number of the volume to be marked, then enters a chain of IF...THEN...ELSE statements.

A call is made to 'MARKED', which returns the zeroeth entry of the primary directory in 'volinfo'. If 'MARKED' returns TRUE, there is already a duplicate directory, so we put out an appropriate message and nothing more.

If 'MARKED' returns FALSE it could be because there was an I/O error, so we check to see if that happened and make a call to 'ERROR__PROC' if it did.

If no I/O error was committed, we know there is no duplicate directory; so we next check the value of 'dnumfiles' in 'volinfo'. If 'dnumfiles' is zero, (continued on page 52)

MARKETING YOUR SOFTWARE

by Richard Loggins

You've just finished a program that you're sure would sell if you could just get it on the market. If you are filthy rich, the solution is simple—set up your own company, hire all the right people, and you're off!

On the other hand, if you're like me (broke, dumb, inexperienced, and introverted), then you feel completely lost.

None of your friends can offer any suggestions that sound even half reasonable. A trip to the local computer dealer results in "I don't have the slightest idea". Spending all day digging through the stacks of back issues of computer magazines doesn't help. Going down to the public library only provides sore feet and Excedrin headache number 293.

Don't misunderstand. Everyone I talked to honestly tried to help, but the information needed just couldn't be found or didn't exist. Perhaps the procedure is taught in the Programming Classes at the university. Again, not much help to me. I mean, the only thing that kept me out of college was high school.

But take heart, it really isn't hard to get your software reviewed. I'm far from being an expert on the subject, but I can tell you what I've learned from my experience in getting my software published. Perhaps it may save someone a lot of the trouble I went through.

While getting your software reviewed isn't that hard, getting it published is another matter. There are several steps you can take that will greatly increase your chances. I'll tell

you what I know about them, but remember—my experience is all in the business field. I don't know a hoot about games or utilities, but I'm sure most of this would apply to them as well.

There are three major areas used in evaluating software, and each is equally important. All of them are time consuming and require a lot of work if you hope to be successful.

Before you get into preparing the three items, you need to determine the market for your software. Is it something everyone will use or is it limited to specific or "vertical" markets. Who is going to buy it? I disagree with the old axiom of "Would you buy it yourself?", as I've never met any programmer who wouldn't buy his own software. Look at every conceivable application, even those you think are out of the intended market. Mine was written for electronic manufacturers representatives, and has found its way into the clothing industry and the purchasing department of a Denver hospital.

After you clear this hurdle, you're ready to move on to the more difficult tasks of preparing your package. Personally, I feel the software and instructions should operate off the "KISS" method—Keep It Simple, Stupid. I'm not trying to be derogatory; just trying to explain something. Most of the people that will buy your software will know very little about programming or computers. They're interested in solutions or the end result and couldn't care less how you get there. And they will certainly be lacking the intimacy one

gets from writing the software. Try to write your software so it can be operated without any instructions. When you've gone as far as you can, then write the operator's manual.

Attempt to stay away from computer terminology, and when you do use it, explain it or equate it to something the user will understand. A possible example is "A disk is like a cross between a tape recording and a phonograph record, but instead of storing music we record the information you type in." Don't assume anything. If you do, sure enough someone won't understand what you're trying to say. You should also include a chapter about errors. Explain briefly what causes them and what to do to correct them. Don't send the operator off searching through books to find out what "Error Code 9" is—just tell him.

When you have finished your manual, it's time to test your software. Not to see if it works—but to find out where it doesn't work. During this procedure you should try to get as far out in left field as you can. Put the disk in upside down or sideways. Put in the wrong disk. What happens if you type in alpha characters instead of numeric characters?

Now you have everything fixed where you can't possibly mess it up. Get hold of your wife or your twelve year old kid, turn off the computer, give them the disk and the operator's manual and leave the room. If your program doesn't blow up in fifteen minutes, then you're in pretty good shape.

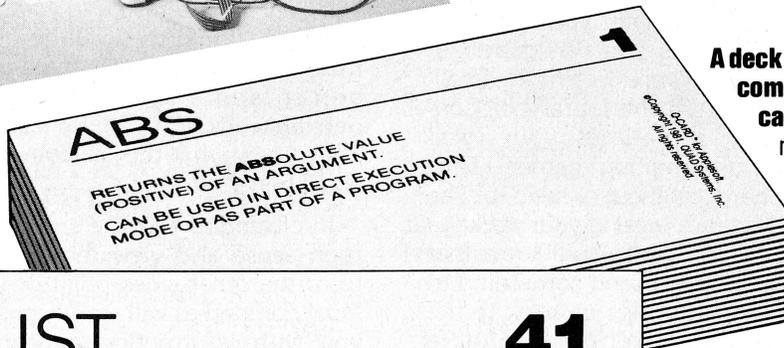
The next item on the list is to prepare what I call a "Submission Pack-

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LIST 41

PRINTS THE CURRENT PROGRAM IN MEMORY ON THE SCREEN.

CAN BE USED IN DIRECT EXECUTION MODE OR AS PART OF A PROGRAM.

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LIST
PRINTS THE ENTIRE PROGRAM.

LIST 15Ø
PRINTS LINE 15Ø

LIST-15Ø
PRINTS FROM THE BEGINNING OF THE PROGRAM UP TO LINE 15Ø

LIST 15Ø-
PRINTS FROM LINE 15Ø TO THE END OF THE PROGRAM.

NOTE: TO STOP A LISTING PRESS CTRL S
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age". This is what you will send to the software publisher with a bit of confidence and pride. Write up a brief description (in letter form) of your software. Explain what it does, why it does it, and the market you see for it. Be realistic, not overstrong. These people are experts, and literally get bombarded daily by software from individuals looking to crack the market. They have only one main interest—will it make money for them. You can have the most fantastic program in the world, but if it won't sell, it's not worth beans.

Now everything is finished and you are ready to send it off. But to whom and how? I mean, that was the intent of this, right? Okay. Sit down and make a list of ten reputable software publishers. From Apple Computer, Inc. right on down. Beside each name list the type of products they sell. Pick one—and ONLY ONE— whose products "agree" with your software.

The reasons for selecting only one company are important. First, you must understand that someone in the company must sit down and go through your software, and that costs money. If you submit it to a zillion companies and two come back

with an agreement—now what? You've just blown one company for future possibilities. You must respect their position as you wish them to respect yours. If you aren't successful with the first company, you can then proceed to the next and no one will get upset. When you send it, send it to "Software Evaluation" or "Marketing—Third Party Software". It may not be the specific department name they have, but it will get into the right hands.

Now to ease your mind a bit about someone ripping off your software. There are no absolute guarantees, but for less than fifteen dollars you can sure strengthen your position. For ten dollars you can copyright your own software. Forms are available free from the Library of Congress, or sometimes your local Federal Information center. They aren't hard to fill out or send in. The second step is to send your package via Certified Mail. This will prove that you actually did send something to them. Which brings us back to the reason for selecting reputable publishers in the first place. Every reputable publishing firm I know of has no more interest in stealing your software than the man in the moon, and there are valid reasons for this.

It's cheaper for them to execute an agreement and it won't damage the reputation they spend enormous amounts of money to build. Most of them even go as far as to provide a "Non-Disclosure Agreement" for you.

Once they have your software, give them some time to get to it. Everyone knows you can do a preliminary evaluation in a day or so, but remember, they get hundreds per month. If you haven't heard from them in four to five weeks, then it's time to follow up with a letter or phone call.

If they are interested in your software, you'll find they will go out of their way to assist you in making it a better and more marketable package. DON'T FIGHT THEM. They know what they're doing, and you'll benefit from it.

In closing, try to use some common sense and view the situation from the other sides point of view. Most companies will readily provide you with information concerning their position on Third Party Software if you will simply ask. As I said, I'm no expert, but it worked for me and it just might help you. Good Luck!



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ARTSCI explains why some word processing systems are better than others.

Let's begin with an easy to understand explanation of what a word processor is and how ARTSCI has created a professional system.

A word processing system is simply an easier, faster and less expensive way to type. With a modern word processor, documents are entered on a video screen instead of paper.

You can enter your first rough draft without concern about errors or spelling. Simply go back and insert letters, delete words and even move paragraphs with a few keystrokes. No document will ever have to be retyped.

WORD PROCESSING AND THE APPLE II

The APPLE II is the most expandable, inexpensive micro-computer available today. It can perform almost any task, including word processing.

The standard APPLE II however, uses a 40 column video display. This display causes a serious word processing problem: How do you display a full sized 80 column letter? Most word processing programs available today do not solve this problem.



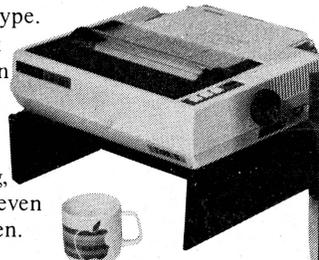
THE MAGIC WINDOW

ARTSCI has developed the MAGIC WINDOW word processing system that incorporates the full power of a professional word processor and solves the APPLE'S display problem without expensive hardware.

The first feature of a professional word processing system is the ability to enter and edit data in a fast and friendly manner. The MAGIC WINDOW operates just like a standard typewriter. The electronic paper moves to the left across the video screen as you type. Almost any size document can be represented on the video screen. You can see the edges

of the paper through this MAGIC WINDOW as you type.

The rule is: What you see on the screen is what you'll get in print. However, if you print using proportional spacing, the result will look even better than the screen.



This typewriter simulation, together with simple to use menu selection of functions and electronic editing abilities, creates the finest word processor available on the standard APPLE II.

MAGIC SPELL

The second feature of an advanced word processor is the ability to find and correct mistakes. The most common mistakes in most documents is the misspelled word.

ARTSCI's MAGIC SPELL program will take any document you can create and find spelling errors. Over 10,000 commonly misspelled words are known to MAGIC SPELL. You can also add new words to the vocabulary at any time.

CUSTOM LETTERS

The third feature of a professional word processing system is the ability to alter a document by replacing names and other related data from mailing lists.

Form letters, invoices, and almost any document can be individualized by replacing names, addresses or any other personal data anywhere in the document using ARTSCI'S BASIC MAILER.

By using the BASIC MAILER you can take any mailing list and sort through the list by different criteria and print personalized letters with a few simple keystrokes.

A COMPLETE SYSTEM

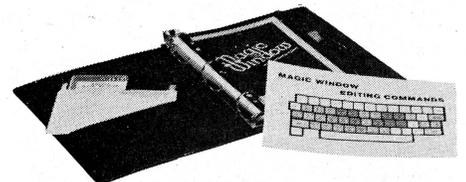
These three programs, THE MAGIC WINDOW, MAGIC SPELL AND THE BASIC MAILER, together form the only complete and professional word processing system available on



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the standard APPLE II computer system.

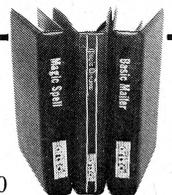
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Your Apple can also join you in the Scrabble® brand crossword game, the world's best-selling word game.

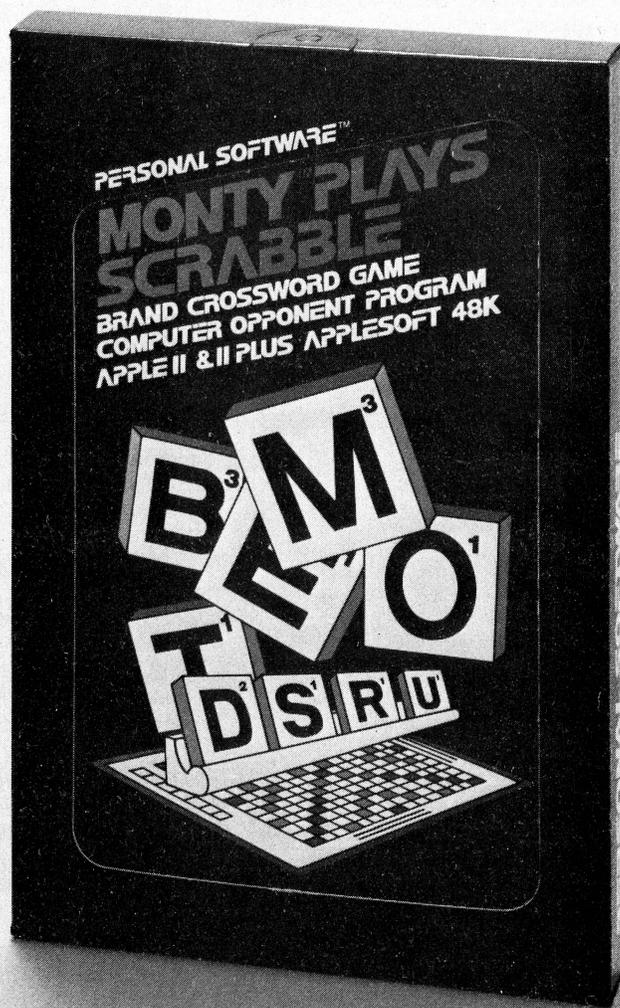
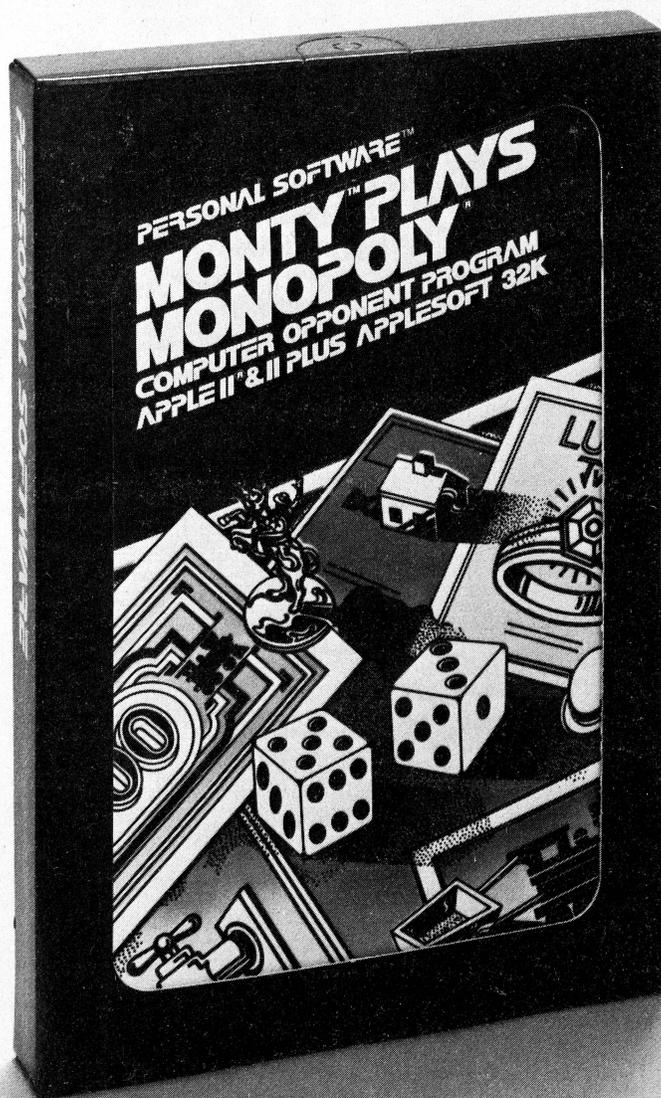
MONTY® Plays Scrabble® has a vocabulary of over 54,000 words and plays at four levels of difficulty. Up to three people can play with MONTY, who will keep score for everyone. Available on diskette for the Apple II with 48k, one 16-sector disk drive and a Language card or AppleSoft card, or the II Plus with 48k and 16-sector disk drive.

Both programs act as computerized opponents rather than being computer reproductions of the games themselves. The complete Monopoly and Scrabble sets are required.

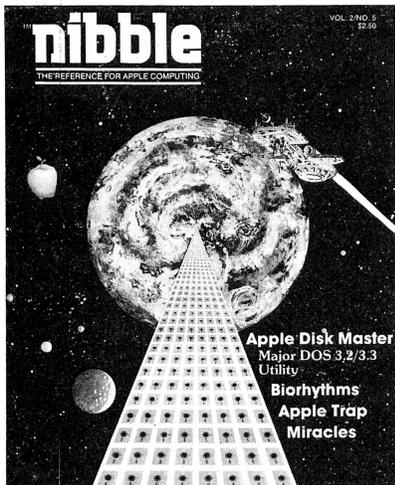
Both computer programs were created by Ritam Corporation. See them at your local retail computer store.

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APPLES DOWN ON THE FARM

by Milo Tenney

Far from being what lyricists, idealists, or politicians would have us believe, farming is a tough, competitive profession that demands not only hard physical work, but management skills as well. For example, the slightest miscalculation about the weather can plunge farmers into costly and at times legally binding predicaments emanating from poor decisions about how they use their labor force, how they apply agricultural chemicals, how they dispose of agricultural wastes, how they plan irrigation, etc.

Given that farming is a business as well as a way of life for many, it's not surprising that business applications for the Apple would soon sprout in the agricultural community. What many farmers are finding out is that the Apple's capability for handling information can meet many of their needs in a sometimes precarious business.

The letters received from agricultural Apple owners have led to formation of an Agricultural Special Interest Group, or "AgSIG", within the International Apple Core. Our aim is to consolidate our knowledge with your contributions, for everybody's benefit. We'll deal with all topics that have to do with agriculture and Apple computers. For this article, we'll take a general overview of using the Apple in running a farming business. If you own an Apple but not a farm, you may still find something applicable to your line of work, so don't go away just yet.

So just what can you do with your Apple to benefit your farm? As we noted, the Apple is best suited for handling information. It can't and won't make any management decisions for you, but it will help you to make better decision by allowing

you to evaluate more information in less time, and to do it more accurately. So you know all that. What you need to know is how to put together a workable package.

Well, to get a perfect package for running your farm, all you need to do is spend a few months sharpening your programming skills, and then a few years developing the perfect package of programs. Unfortunately, in the meantime the business would go down the drain. Which puts you in the market for two kinds of software: accounting/financial, and agricultural.

The first category, business software, is available in abundance. . . but not all of it will meet your needs. Many accounting software packages are geared to firms with accounting staffs to operate the system. Your best bet may well be to obtain a system that you can handle yourself, without spending too much time on it, or completing a graduate accounting course.

The person who can help you most is, of course, your accountant. This is particularly true in the area of report generation. If the software generates reports that your accountant can't make head or tail of, it's of no value. It's also of less value if your *banker* can't easily determine your financial position; you're more likely to get the loan you want if you can show your banker that you know where you stand, and that you have modern methods working for you. When you're looking for a financial accounting system, make sure it provides the information you need with minimal effort on your part.

While financial systems can be more or less standard for the full range of farming enterprises, other systems certainly are not. After your

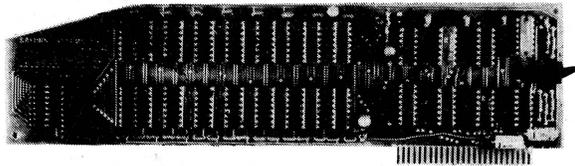
financial package, what you buy will depend on what sort of business you're in and what you want done. For record-intensive enterprises (cattle, dairy, and hog farming, for example), a good package should allow you to maintain your complete herd records without devoting too much time to it. You should be able to update, correct errors, and get information quickly and easily. Remember too that you won't be using your system every day, and the screen menu and prompts should be enough to keep you from relying on your memory or endlessly paging back and forth through a manual.

For more specific programs, a call to your local extension agent would be a good start, to see what's available in your area. Some of the best sources of programming information will be the state universities. Ag departments in several universities have been actively involved in developing software systems for some time. You'll probably find good, small programs that are written to solve one problem at a time. They can provide quick answers to questions like how much fertilizer to apply to a particular field, what adjustments to make to your planter for a certain application, or how much you can justifiably pay for a given dairy cow. One problem with these programs is that they are single-purpose, individual function programs, not complete systems, although the trend is toward more comprehensive programs.

Some companies have begun producing software for the farmer; we'll mention three that we've heard about here. If you've tried 'em, let us know; if you're happy with others, let us know too.

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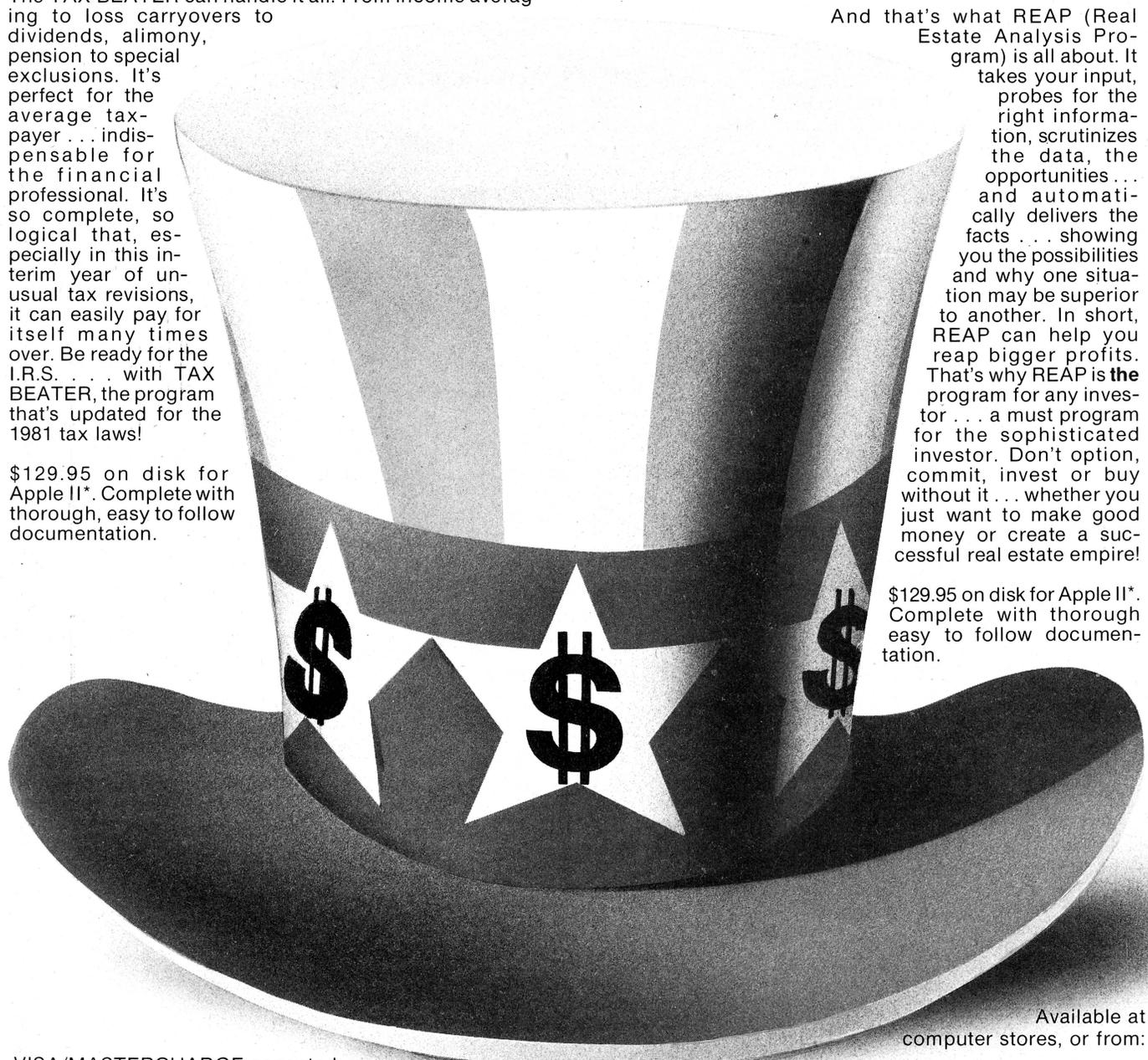
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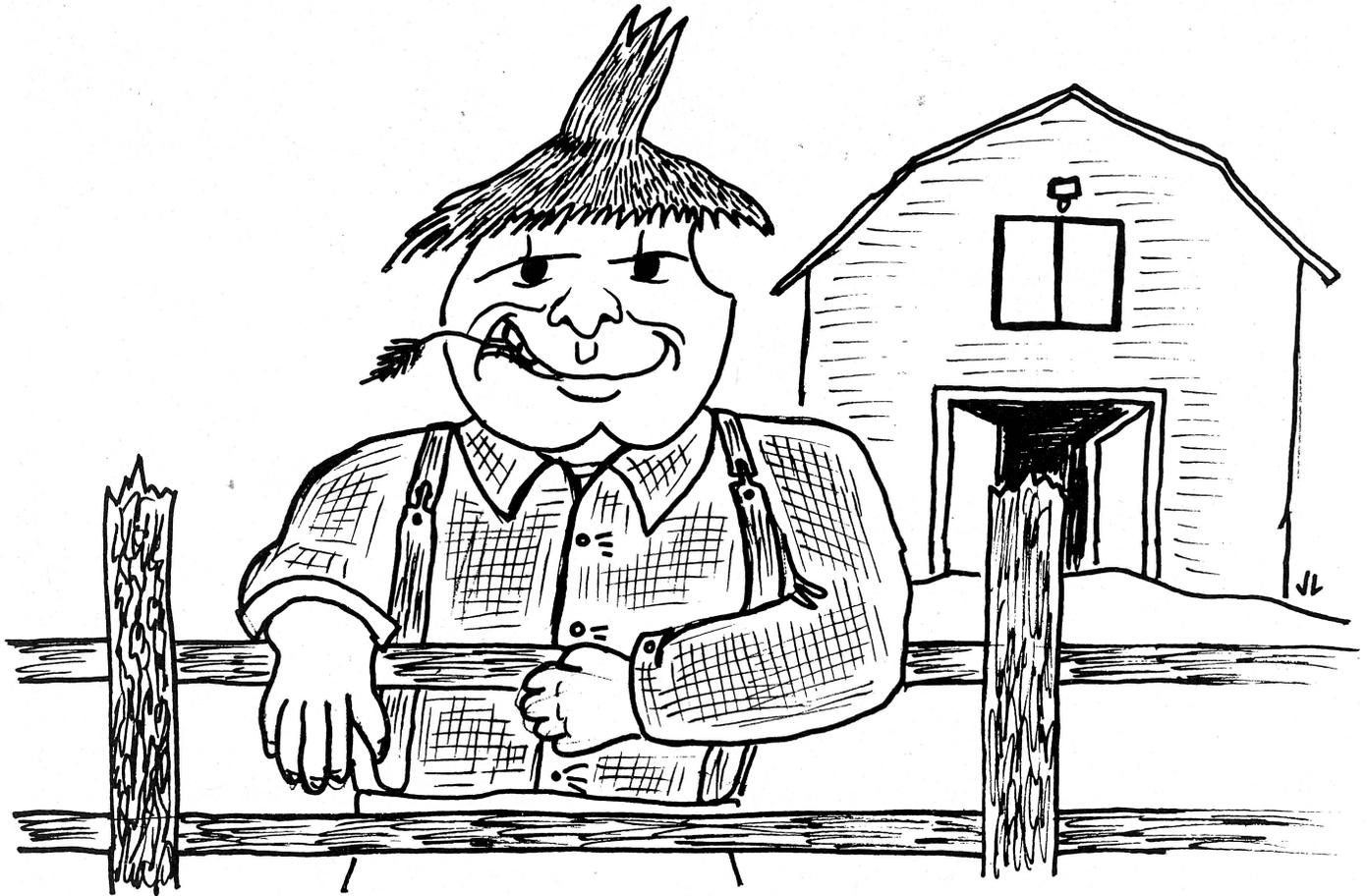


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Dalex Computer Systems has developed two versions of a detailed least-cost ration system. The larger version sells for \$2500, the smaller for \$750. The large system can handle up to a 20 x 20 matrix, and solve large problems in 35 seconds (most programs of this type cause the computer to churn for a few minutes before coming up with the answer). Dr. Carl Alexander, President of Dalex, has built into the system's memory standard requirements for beef and dairy cattle as well as swine. Problem solutions can be saved for later review and modification.

Dalex is also working on an accounting and billing package covering the special problems of the commercial feedlot, including customer-specific recordkeeping.

Farmplan Computer Systems offers a general farm accounting system, and specialized packages for crops, dairies, and hog breeders (this last has become known as the "pig package"). As an example, the dairy package allows maintenance of complete production and reproduction records on each animal in the

herd, lactation graphs, and an "action reminder" routine that keeps track of cows that should be in heat, should be pregnancy checked, should calve, etc. The cows can also be sorted in order of number, production, last calving date, and other characteristics. Printouts provide permanent records. Farmplan is developing systems for beef and sheep, as well as other specialties.

We mentioned the weather at the beginning of this article. Imagine this scene: the farmer sitting at the kitchen table enjoying that first cup of coffee before dawn, and pondering the day's weather, not yet predictable by eye in the darkness. The questions are, "What kinds of jobs can I get done today?"; "What will the weather let me do?"; "Will I be caught in mid-field with a tractor mired in mud from a morning rain?"; "Will today be too windy to spray, or to burn off that rice stubble?"

Casually, the farmer punches the keys on the Apple. Almost immediately, the color TV screen lights up with charts and graphs conveying

localized weather information, and the farmer's daily plans are made in short order. It's a system developed by scientists at California State University, Chico, called Nowcasting, transmitted by telephone lines through a Modem. The system will provide weather information less than an hour old, including temperature, wind speed and direction, presence of precipitation, and other elements. Nowcasting is undergoing testing at this time.

That modem (short for MODulator/DEModulator) can also use 'phone lines to connect an Apple to the excellent timesharing services that are available. Several of these deal specifically with agriculture, and are used to supplement the farmer's own system. AgNet, in Lincoln, Nebraska, is one service with many programs that can be downloaded into the Apple.

The Apple computer, it is said, can become as important a tool to the farmer as the tractor. IAC's AgSIG expects to help and to document that growth; let's hear from you.



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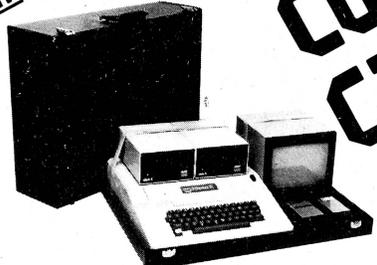
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(continued from page 39)

there are no active files on the disk; so we are safe in establishing a duplicate directory via a call to 'MARKIT'.

If 'dnumfiles' is not zero, we know there are files on the disk. Therefore, we need to find out where the first file starts. To do that, we read in the primary directory via a call to 'GET_DIR' and check the value of 'dfirstblk' in the first file entry, 'dir[1]'. If 'dfirstblk' is less than maxdirblk = 10, then the file starts in the space where the duplicate directory should go so we display an appropriate message and exit.

If 'dfirstblk' is greater than or equal to 'maxdirblk', then we are safe in

writing a duplicate directory.

The procedure 'MARKIT' sets up the duplicate directory. It first fetches the primary directory. If successful, it updates the value of 'dlastblk' in 'dir[0]', then writes the directory and a duplicate on the disk. Successful execution of 'MARKIT' informs the system of the existence of a duplicate directory which causes it to maintain the duplicate.

Recovering from Disaster

We use 'COPY_DUP_DIR' to recover from directory crashes. It simply copies the duplicate directory into the space reserved for the primary directory. Assuming that what-

ever disaster destroyed the primary left the duplicate intact, we will be back in business.

Note that 'COPY_DUP_DIR' does no checking for a duplicate directory. It is up to the user to decide whether or not it makes sense to copy.

Summary

The techniques and routines described here should provide some measure of protection against directory disasters. They are not the only techniques, but they should help.

Happy computing and Blaise Away!

```
(*S+ swapping on for units *)
(*R- range checking off for speed *)
(*I- i-o error checking off- we do our own *)
(*Q+ no compiler messages *)
UNIT dir_ops;
INTERFACE
```

```
(*
Apple Pascal System Disk Directory Structure
=====
```

```
Supplied by Apple Computer, Inc.
Dated 1 June 1980
*)
```

```
CONST
maxdir=77;    { maximum number of entries in directory }
vidleng=7;   { number of characters in volume id }
tidleng=15;  { number of characters in title id }
fblksize=512; { standard disk block length }
dirblk=2;    { directory starts at this disk block address }
dupdirblk=6; { duplicate directory starts here }
maxdirblk=10; { lowest block for files if duplicate directory is present }
dirleng=4;   { number of disk blocks allotted to directory }
maxunit=12;  { highest numbered physical unit }
```

```
TYPE
daterec=PACKED RECORD
    month:0..12;    { 0 implies meaningless date }
    day:0..31;
    year:0..100;   { 100 implies dated volume is temporary }
END;
```

```
vid=string[vidleng];    { volume id }
```

```
dirrange=0..maxdir;
unitrange=0..maxunit;
```

```
tid=string[tidleng];    { title id }
```

```
filekind=(untypedfile,xdiskfile,codefile,textfile,infofile,datafile,
graffile,fotofile,securedir);
```

```

direntry=PACKED RECORD          { directory layout }
  dfirstblk:integer;           { first physical disk address }
  dlastblk:integer;           { points at block following last used block }
  CASE dfkind:filekind OF
    securedir,untypedfile:    { only in dir[0], this is volume info }
      (filler1:0..2048;       { 13 bits for downward compatibility ?? }
        dvid:vid;
        deovblk:integer;      { number of blocks in this volume }
        dnumfiles:drrange;    { number of files in directory }
        dloadtime:integer;    { time of last access ?? }
        dlastboot:daterec);   { most recent date setting }
    xdskfile,codefile,textfile,infofile,
    datafile,graffile,fotofile:
      (filler2:0..1024;       { 12 bits for downward compatibility }
        status:BOOLEAN;      { for filer wildcards }
        dtid:tid;            { title of file }
        dlastbye:1..fblksize; { number of bytes in file's last block }
        daccess:daterec);    { date last modified }
  END;

```

```

directory=ARRAY [drrange] OF direntry;
physunits=SET OF unitrange;

```

```

FUNCTION get_dir(unitnum:INTEGER;
                VAR dir:directory;VAR ioerror:INTEGER):BOOLEAN;

```

```

FUNCTION get_dup_dir(unitnum:INTEGER;
                    VAR dir:directory;VAR ioerror:INTEGER):BOOLEAN;

```

```

FUNCTION put_dir(unitnum:INTEGER;
                VAR dir:directory;VAR ioerror:INTEGER):BOOLEAN;

```

```

FUNCTION put_dup_dir(unitnum:INTEGER;
                    VAR dir:directory;VAR ioerror:INTEGER):BOOLEAN;

```

```

FUNCTION get_vol_info(unitnum:INTEGER;
                    VAR volinfo:direntry;VAR ioerror:INTEGER):BOOLEAN;

```

```

FUNCTION marked(unitnum:INTEGER;
                VAR volinfo:direntry;VAR ioerror:INTEGER):BOOLEAN;

```

IMPLEMENTATION

```

FUNCTION get_vol_info;
BEGIN
  unitread(unitnum,volinfo,sizeof(volinfo),dirblk);
  ioerror:=ioresult;
  get_vol_info:=(ioerror=0);
END;

```

```

FUNCTION marked;
BEGIN
  ioerror:=0;
  IF NOT get_vol_info(unitnum,volinfo,ioerror) THEN marked:=FALSE
  ELSE marked:=(volinfo.dlastblk=maxdirblk);
END;

```

```

FUNCTION dir_put(unitnum:INTEGER;VAR dir:directory;
                blk:INTEGER;VAR ioerror:INTEGER):BOOLEAN;

```

```

BEGIN
  unitwrite(unitnum,dir,sizeof(directory),blk);
  ioerror:=ioresult;
  dir_put:=(ioerror=0);
END;

```

```
FUNCTION dir_get(unitnum:INTEGER;VAR dir:directory;
                blk:INTEGER;VAR ioerror:INTEGER):BOOLEAN;
```

```
BEGIN
  unitread(unitnum,dir,sizeof(directory),blk);
  ioerror:=ioresult;
  dir_get:=(ioerror=0);
END;
```

```
FUNCTION put_dir;
BEGIN
  put_dir:=dir_put(unitnum,dir,dirblk,ioerror);
END;
```

```
FUNCTION get_dir;
BEGIN
  get_dir:=dir_get(unitnum,dir,dirblk,ioerror);
END;
```

```
FUNCTION put_dup_dir;
BEGIN
  put_dup_dir:=dir_put(unitnum,dir,dupdirblk,ioerror);
END;
```

```
FUNCTION get_dup_dir;
BEGIN
  get_dup_dir:=dir_get(unitnum,dir,dupdirblk,ioerror);
END;
```

```
BEGIN
  (* no initialization code *)
END.
```

```
PROGRAM mark_dup_dir;
```

```
USES
```

```
  (*$U dirops.code *)
```

```
  dirops;
```

```
VAR
```

```
  unitnum,ioerror:INTEGER;
```

```
  dir:directory;
```

```
  volinfo:direntry;
```

```
PROCEDURE error_proc(errcase:INTEGER;ioerror:INTEGER);
```

```
BEGIN
```

```
  writeln(chr(7));
```

```
  CASE errcase OF
```

```
    1:writeln('ioerror ',ioerror,' reading unit.');
```

```
    2:writeln('ioerror ',ioerror,' writing to unit.');
```

```
  END;
```

```
  exit(markdupdir);
```

```
END;
```

```

PROCEDURE markit(unitnum:INTEGER);
BEGIN
  (* read primary directory *)
  IF NOT get_dir(unitnum,dir,ioerror) THEN error_proc(1,ioerror)
  ELSE BEGIN
    (* update 'dlastblk' to indicate duplicate directory *)
    dir[0].dlastblk:=maxdirblk;
    (* write updated directory back to primary directory area *)
    (* and also write it to secondary directory area *)
    IF NOT put_dir(unitnum,dir,ioerror) THEN error_proc(1,ioerror)
    ELSE IF NOT put_dup_dir(unitnum,dir,ioerror) THEN error_proc(2,ioerror)
    ELSE writeln('Duplicate directory marked.');
```

```

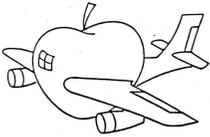
  END;
END;

BEGIN
  page(output);
  gotoxy(0,5);
  REPEAT
    write('Enter number of unit to mark: ');
    readln(unitnum);
    writeln;
  UNTIL (unitnum IN [4,5,9..maxunit]);
  IF marked(unitnum,volinfo,ioerror) THEN writeln('Unit is already marked.')
  ELSE IF NOT (ioerror=0) THEN error_proc(1,ioerror)
  ELSE IF (volinfo.dnumfiles=0) THEN markit(unitnum)
  ELSE IF NOT get_dir(unitnum,dir,ioerror) THEN error_proc(1,ioerror)
  ELSE IF (dir[1].dfirstblk<maxdirblk)
    THEN writeln('File(s) in duplicate directory space')
  ELSE markit(unitnum);
END.
```

```

PROGRAM copy_dup_dir;
USES
  (*$U dirops.code *)
  dirops;
VAR
  unitnum,ioerror:INTEGER;
  dir:directory;
BEGIN
  page(output);
  gotoxy(0,5);
  REPEAT
    write('enter unit number: ');
    readln(unitnum);
    writeln;
  UNTIL (unitnum IN [4,5,9..maxunit]);
  (* read directory from duplicate directory area, *)
  (* then write it out to the primary directory area *)
  IF NOT get_dup_dir(unitnum,dir,ioerror)
    THEN writeln('Error reading duplicate directory')
  ELSE IF NOT put_dir(unitnum,dir,ioerror)
    THEN writeln('Error writing primary dirrectory')
  ELSE writeln('Duplicate directory copied');
END.
```





plane apple

A REVIEW OF EXPEDITER II

by Ken Keen
"Plane-Apple"
Wichita, Kansas

The arrival of compilers for Applesoft promises to let programmers have the best of both the compiler and interpreter worlds. At least two compilers for the Apple II have come on the market lately. This review will cover one of them. On-Line System's "Expediter II".

INTERPRETERS VERSUS COMPILERS

Applesoft is an interpreter, which means that it takes the BASIC code given to it as input and executes it. No "object code" or "object program" is produced; an interpreter simply executes the "source" program itself. An interpreter will analyze and convert a source statement each time it is to be executed, which obviously isn't very efficient. Another inefficiency comes when branching instructions (GOTO and GOSUB) are encountered; the interpreter doesn't know where the referenced line is and must perform a search. Several articles have appeared lately showing ways to speed up Applesoft in this area.¹ Most of us are quite familiar with the advantages of Applesoft (or almost any interpreter):

1. Easy to learn and write code (compared to, say, Assembly language).

2. Easy testing. Most of us debug portions of a program by entering "RUN n" to check out a particular section of code.

3. Easy debugging. After a program has "blown up" or any time the keyboard is presented with a "READ" (except for the "GET" statement) a "Control-C" will allow the programmer to interrupt execution and determine the value of any program variable. This can be an extremely useful tool; it allows the pro-

grammer to bypass looking up addresses in memory and converting values to meaningful data.

4. Easy changing. The program is modified by simply inserting, deleting, or changing lines of code: what you see (or LIST) is what you've got. There are no other intermediate steps to modify the program. The change is permanent when the file is saved to tape or disk.

5. A smaller amount of memory can be used. Interpreters usually allocate storage to variables as they "run into them" and thus can allocate only the ones that are used.

6. A smaller amount of disk space can usually store the program because the storage for the variables is not contained in the program itself.

With all these advantages, why would anyone want a compiler? Quite simply, because a compiler offers several advantages unavailable to interpreters:

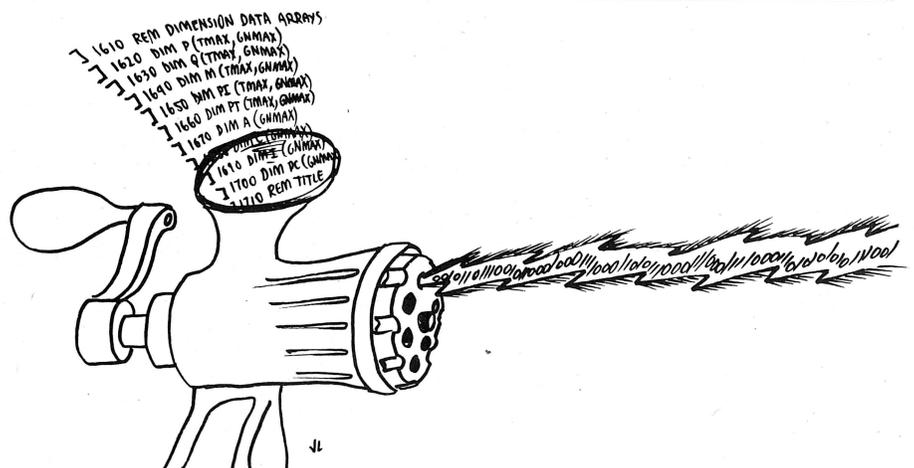
1. Speed of execution. This is, of course, the primary advantage. The compiler takes the "source" code (Applesoft in this case) and "compiles" it into machine language. All references to variable names are

converted to specific memory locations and all referenced labels are converted to exact memory addresses.

2. Elimination of "programming tricks". We've all seen these; sometime they come documented in the manuals: "... use variables instead of constants. It takes more time to convert a constant to its floating point (real number) representation that it does to fetch the value of a simple or array variable. This is especially important within FOR...NEXT loops or other code that is executed repeatedly."² With a compiler, these conversions are all done once, at compile time.

3. Security. A certain amount of security is gained because the program is unavailable in the source form; a user cannot "Control-C" out of it and list (or print) the program. Given a starting address, the program can be "dis-assembled", but at best this results in assembler code.

The acquisition of a compiler, then, allows the "best of both" mentioned above. Programs may be entered, tested, debugged, refined, and quickly changed using Applesoft,



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then the final version can be compiled to provide the speed and security.

FIRST EXPERIENCES WITH EXPEDITER II

After receiving my copy of "Expediter II" I quickly skimmed the 16 pages of documentation until I found the section "Compiling Your First Program" a 13-step procedure. Since I had another program loaded at the time and wanted it compiled I ignored the small sample used in the procedure (typical?). The compiler responded as expected: asking me if I wanted the default parameters, and providing a display for each line in the program like this:

```

LINE:10 PC:$1120 VAR:$9600
        SRC:$0DEF
LINE:20 PC:$1127 VAR: $9600
        SRC:$0DCC
LINE:30 PC:$112E VAR:$9600
        SRC:$0DAA
    
```

As these were rolling up the screen, I was starting to feel pretty good. Then I hit line 450:

DIM OR REDIM ERROR AT LINE 450

The compiler kept on compiling while I started skimming the manual again. This was a program that ran properly so I was a bit puzzled. The error message helped: "More than one dimension statement found for an array, a reference was made to the array prior to its dimensioning or a variable was used as an operand on a dimension statement." When the

compiler was done, I reloaded the source program and listed statement 450:

```

450 DIM DESC$(N),AMT(N),
    PMTS(N),JUL(N),NYB(N),AE(N)
    
```

The compiler obviously didn't like "N" as a subscript. I changed "N" to a suitable number and recompiled perfectly the next time.

TIME TRIALS

The manual stated "... your compiled program runs up to 20 times faster than the original."³ Curiosity took over; I decided to make some tests to determine whether or not I could come any where close to this figure. I chose to use a "compute-bound" program to test to keep from adding time for running a disk drive, a printer, or introducing a variable at the terminal (me) that I didn't want to include. I had recently read an article⁴ that had two things I decided would work well to help in my tests: one was a number generator, the other was a Shell-Metzner sort. I "borrowed" the pieces I wanted and came up with the program in Figure 1. Because I don't have a clock-card that would allow the program to time itself I had to rely on my stopwatch. I ran tests 1 and 2 enough times to let me average out any errors. Test 3 quickly convinced me that almost 9 minutes with a stopwatch is a long time and that I only wanted to run it once. Test 4 was run to see if the compiled version times would double over test 3. Here are the results, with all times in seconds:

Looking at the percent columns, the improvement I measured was 2-3 times faster for generating the numbers and 6-8 times faster for the sort. Not 20 times, but certainly not insignificant either!

The documentation also claims the compiler will compile at "approximately 60 lines per minute".⁵ The sample used for testing came very close—there are 50 lines in the program. However, another program I compiled required 299 seconds for 200 lines—an error rate of 50%. Obviously this is a difficult thing to estimate, because of the difference in length possible in Applesoft statements. In the test program, no attempt was made to put multiple statements on a line, the other program did extensively.

David Bartley⁶, explored some of the ways to speed up Applesoft GOTOs. As another test, I entered his test programs. This program, preceded by 30 REMs takes about 38.1 seconds:

```

100 FOR I= 1 TO 10000
200 GOTO 120
300 NEXT I
    
```

While this program, logically identical, takes 17.8 seconds:

```

100 FOR I= 1 to 10000
200 GOTO 300
300 NEXT I
    
```

The reason for this is the way Applesoft converts and searches for line numbers; Mr. Bartley gives several ways to avoid this problem. With a compiler however, the problem vanishes completely. I compiled both programs and found they took identical times: 12 seconds or about 33% faster than the fastest Applesoft version.

PROGRAM OPTIONS

Expediter II appears to be a well thought-out program. I haven't had time or the need to use all the options in all the possible combinations. Here are a list of features and options:

1. There is a trace capability in the compiled code.
2. All DOS functions and standard Applesoft error messages are supported.

TEST #	SAMPLE			APPLESOFT		EXPEDITER		EXPED/APPLE	
	Size	Mean	Std. Dev.	Gen. Time	Sort Time	Gen. Time	Sort Time	Gen. %	Sort %
1	20	100	15	2.5	2.5	.8	.3	32%	12%
2	100	1000	150	13.7	30.1	6.9	4.1	50%	14%
3	1000	1000	300	126.7	528.3	67.0	78.6	53%	15%
4	2000	1000	300	—	—	134.2	191.9	—	—

COMPILER STATISTICS:	COMPILE TIME	MEMORY USED	DISK SECTORS
EXPEDITER W/O TRACE OPTION:	46.1	11,761 bytes	17
EXPEDITER WITH TRACE OPTION:	50.6	12,132 bytes	18
(APPLESOFT)	—	—	5)

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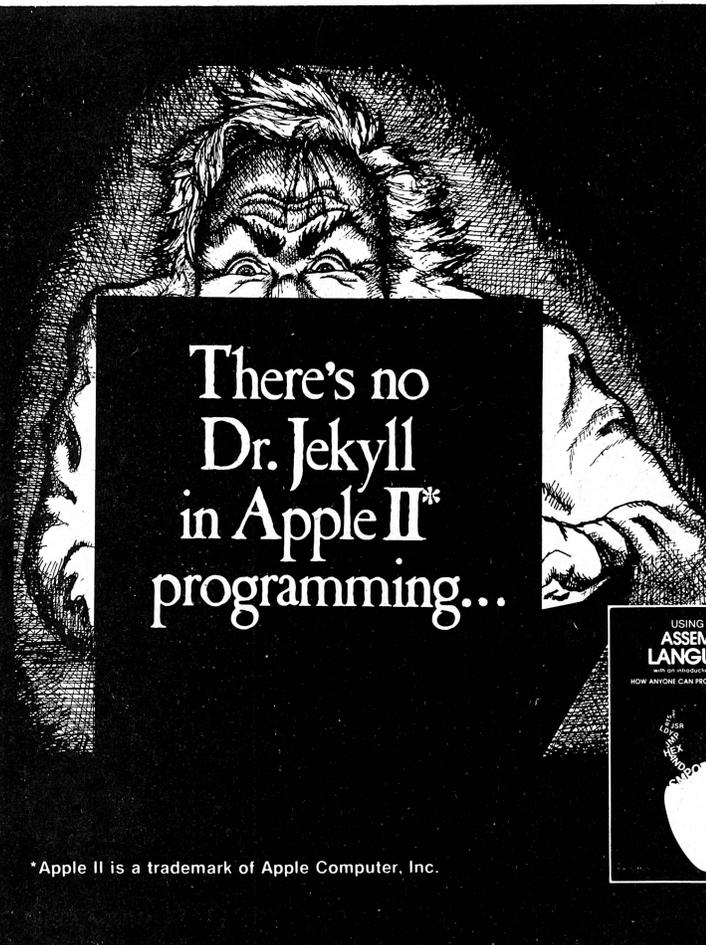
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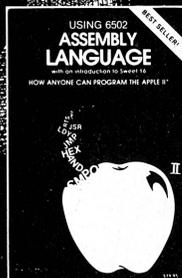


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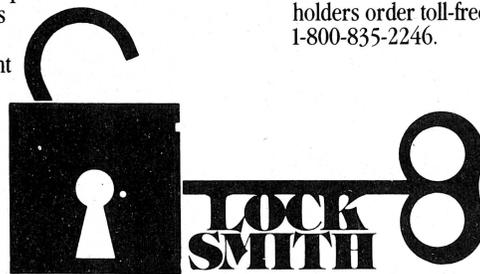
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3. Existing routines in Applesoft ROM are used to minimize memory use.

4. At compile time, the generated statistics can be printed, giving a permanent record of the total memory required and the starting address for each line of code.

5. Programs can be compiled to reside at any location in memory; permitting true "sub-programs" and program-overlays.

6. Variable (by using "REM" statements) can be specified as "local" or "global".

7. Sections of memory used for other purposes (such as HiRes graphics or machine language routines) can be reserved and skipped by the compiler.

8. Since the compiler resolves all addresses, it must make an assumption about string lengths. The default is 40 bytes, but is easily changed.

9. The following commands are NOT supported: DEL, HIMEM, LO-MEM, RESUME, RECALL, STORE, CONT, AND LIST. The reason for these not being supported are explained in the documentation and are either very logical or alternatives are offered to accomplish a desired result.

CRITICISMS

Nothing is perfect; the following gripes I think are small, nevertheless, they are there. The displays from the compiler are screen oriented. My printer has a "short-line" command that nicely moves the display closer to the center of the page when printing. If you don't have this option, the display may print too far to the left to allow it to be placed in a binder.

Secondly, I don't like the statement found on the page 2 of the manual: "Expediter II is licensed for the personal use of the purchasing party only. If you are interested in marketing software that was compiled using Edpediter II please contact On-Line Systems regarding our third party licensing agreement". The package I received was all sealed in plastic and this licensing notice was not visible prior to opening. Further, why is it necessary? I have purchased the product and have gladly agreed not to sell or distribute copies of the documentation or software. I also own a metal lathe—the manufacturer of it doesn't ask the a "licens-

ing agreement" if I decide to make and sell, say, aluminum candlesticks. (I have not contacted On-Line Systems to find out what the agreement involves. Regardless, I think the analogy is valid.)

CONCLUSIONS

I am quite pleased with my purchase of Expediter II. I have not compared it to any other compiler available for the Apple II, nor have I used all the options available; the options I have tried have performed for me as documented. The compiler has provided a tremendous decrease in execution times and has features that I anticipate will allow it to continue to be an extremely useful tool.

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¹ Bartley, David. "Getting There Faster in Applesoft BASIC." *Apple Orchard*, Spring 1981, p. 46.

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³ Einstein, S. A. and Goodrow, D. S., *EXPEDITER II*. Coarsegold, Ca: On-Line Systems, 1981, p. 3.

⁴ Grillo, John P., "A Comparison of Sorts," *Creative Computing Reprint Series*, vol. 2, no. 6.

⁵ *EXPEDITER II*, p. 3.

⁶ Bartley, David. "Getting There Faster in Applesoft BASIC Part II." *Apple Orchard*, Summer 1981, p. 58-65.

```

3 LIST
3 DIM R2(2000)
5 GOSUB 2000
10 PRINT "SHELL-METZNER SORT"
15 PRINT "READY TO BEGIN SORT?—Y OR N ": GET ANS$
20 N7 = 0
30 C7 = 0
50 M6 = Y
60 M6 = INT (M6 / 2)
70 IF M6 = 0 THEN GOTO 999
80 K6 = Y - M6
90 J6 = 1
100 I6 = J6
110 L6 = I6 + M6
120 C7 = C7 + 1
130 IF R2(I6) < = R2(L6) THEN GOTO 200
140 N7 = N7 + 1
150 T = R2(I6)
160 R2(I6) = R2(L6)
170 R2(L6) = T
180 I6 = I6 - M6
190 IF I6 = 1 THEN GOTO 110
200 J6 = J6 + 1
210 IF J6 > M6 THEN GOTO 50
220 GOTO 100
999 PRINT CHR$(7)
1000 GOSUB 2145
1010 END
2000 REM GENERATE NUMBERS
2010 INPUT "ENTER SAMPLE SIZE: ": Y
2015 IF Y > 2000 THEN PRINT "SAMPLE MUST BE 2000 OR LESS": GOTO 2010
2020 INPUT "ENTER MEAN: ": M
2030 INPUT "STANDARD DEVIATION: ": S
2040 FOR N = 1 TO Y
2050 R = 0
2060 FOR J = 1 TO 12
2070 R = R + RND (5)
2080 NEXT J
2090 R = M + S * (R - 6)
2100 R2(N) = INT (R)
2110 S2 = S2 + R2(N)
2120 S4 = S4 + R2(N) * R2(N)
2130 NEXT N
2140 PRINT CHR$(7);Y;" NUMBERS GENERATED"
2145 PRINT "WANT TO DISPLAY NUMBERS? Y OR N ": GET ANS$
2150 IF ANS$ < > "Y" AND ANS$ < > "N" THEN GOTO 2145
2160 IF ANS$ = "N" THEN GOTO 2200
2170 FOR KK = 1 TO Y STEP 5
2180 PRINT R2(KK);" " ;R2(KK + 1);" " ;R2(KK + 2);" " ;R2(KK + 3);" " ;R2(KK + 4)
2190 NEXT KK
2200 RETURN

```

Figure 1

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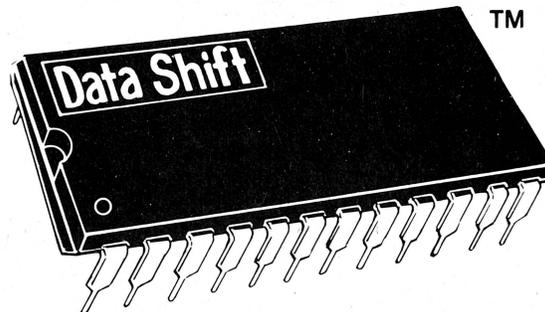
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SINGIN' THE DISK I/O BLUES

by Mark L. Crosby
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edited by Mark L. Crosby

Do any of these situations sound familiar to you?

- You have just turned on your Apple to play a new game that cost you \$40. The disk won't boot, but rather spins and spins—even when you change from 3.3 to 3.2 DOS. You are contemplating sending a letter bomb to the software company.
- Your program is reading in a large text file that has been used many times. This time you get an I/O Error somewhere in the middle of the file and your program comes crashing to a halt. It WAS your mailing list and you meant to make a backup copy last week.
- You have just spent three hours making changes to your program. You save it onto the disk and then run it. It bombs in the middle of the program and when you look at the listing there is garbage in place of a few line numbers that you didn't change. It's bad on the disk too. The rest of the program seems to be intact.
- You can't save your program onto the disk—it keeps giving you an I/O Error (or, alternately, you can't load it off the disk).
- A programmer friend gives you a copy of his newly written personal accounting system to critique but you can't seem to boot the disk.

If any of these situations seem familiar, you may have experienced problems with your disk drive without knowing it. I will cover some of the ways these problems can be avoided and give you some guidelines for keeping your own disk drive in tip-top shape at all times.

First, you should know that tampering with your drive may void any warranty you have so be sure your warranty period is up or be willing to pay the price if you do any damage. Most of the techniques discussed here are easy and safe if you are reasonably careful and follow instructions.

DISK SPEED

The first item we will discuss is disk speed. The Apple II disk drives are designed to operate at 300 rotations per minute (RPM). Because Apple disks are soft-sectored, software is used to find the beginning of and read each track (there are thirty-five of them) and sector (either 13 for DOS 3.2 or 16 for DOS 3.3). The timing holes are not used. This requires that the speed of the drive be fairly accurate. Variations as little as three percent (plus or minus 10 RPM) can cause I/O errors depending on the drive. Typical power line voltages in most business buildings can vary by more than 10 percent!!! The implications of that much variation should be obvious.

The software of the Disk Operating System (DOS) uses timing that assumes the disk is rotating at the correct speed. When you initialize a diskette, DOS puts synchronization (or timing) marks on the diskette which remain in place until the disk is re-initialized. These are known as Address Fields. There are address fields at the beginning and end of each sector on each track. They are not erased by saving data, rather the data is placed between these marks. There are also some extra spaces, or gaps, between them that allow for slight speed variation of the drive—either too fast or too slow (see Figure 1a). Data written within these limits

will always be preserved. If the drive is much too slow, the data will be written too soon. If it is much too fast, the data will be written too late (see Figure 1b). If this is the case, the timing mark(s) may be over-written (erased). This is disastrous and accessing that track again will give you an I/O Error. Once this happens the only cure is to re-initialize the entire disk or that particular track.

The obvious way to avoid these errors is to be sure your drive always operates as close to 300 RPM as possible and check it often. We will discuss how this is done in a moment. Figure 2 shows a comparison of disk speed variations and the results on a "typical" one-year old drive. These results show I/O errors creeping in as the speed changes. The time it takes to read a file is changed as well. The test disk was created at 300 RPM. Two short programs wrote then read one thousand items in a sequential file at both the adjusted (write/read) and at the correct (read only) speed of 300 RPM. The amount of time it took to read that file at the adjusted speed was recorded as were any comments about the results.

The results in Figure 2 show that disk speeds between 291 and 309 RPM are acceptable to the system. This permits using your disk on a drive adjusted to 300 RPM with relatively good results. (This does not take into account other factors such as read/write amplitudes which may be less tolerant than speed). Speeds outside this range will give erratic results. Speeds lower than 270 or greater than 309 will probably erase the timing marks thereby rendering the disk temporarily useless. Disks so damaged must be reinitialized to re-write the timing marks.

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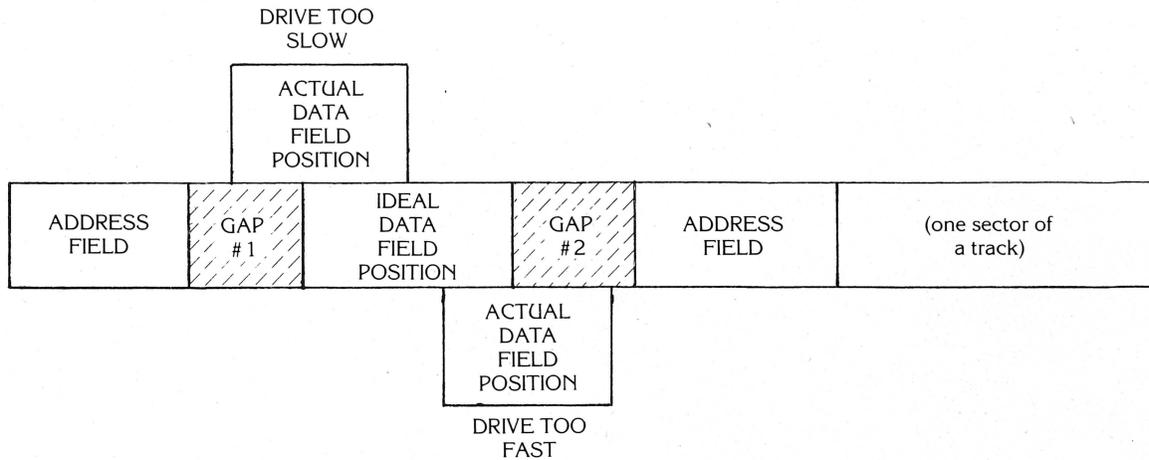


Figure 1a. Data Written Within Limits—Data Preserved

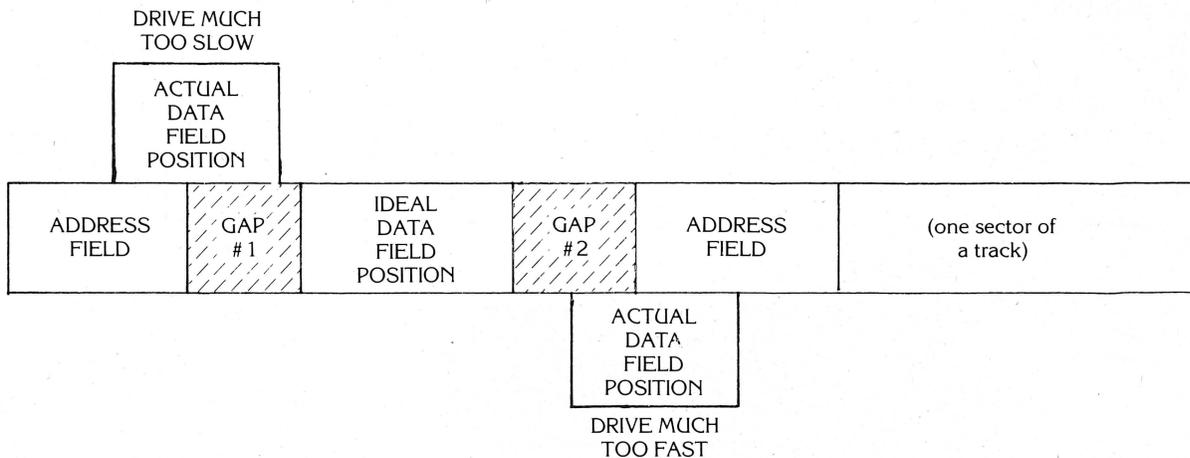


Figure 1b. Data Overwrites Address field—Data is Lost

NOTE: Data Fields are not shown to scale—they are actually much larger

SPEED (RPM)	TIME TO READ 1000 ITEMS AT ADJ SPEED (SECONDS)	TIME TO READ 1000 ITEMS AT 300 RPM (SECONDS)	COMMENTS
265	57	CAN'T	DESTROYED DISK
270	56	I/O ERR	
275	54	I/O ERR	
280	54	I/O ERR	CAN'T READ AT 300 RPM
285	53	I/O ERR	
290	52	I/O ERR	
291*	52	52	
295	51	51	
300	50	50	READ IS SUCCESSFUL
(IDEAL)			
305	49	50	
309*	49	50	
310	49	CAN'T	DESTROYED DISK

Figure 2. Disk Speed Variation Results

Now that you know what speeds are acceptable the questions remains how does one adjust the speed? Well, there are two methods available to you. Both require the removal of the disk drive cover (four screws) and one requires that you remove the base (four more screws). Method #1 requires only a Phillips screwdriver, a small jewelers screwdriver and a neon or fluorescent lamp. It will give good results but you will not be able to measure the actual speed. If you can obtain a disk speed program, either from your Apple user's group or commercially, you will be able to adjust your drive's speed very accurately using method #2 and the screwdrivers only.

METHOD # 1 AND #2.

First, turn off the power to the Apple. Then, remove the disk drive's

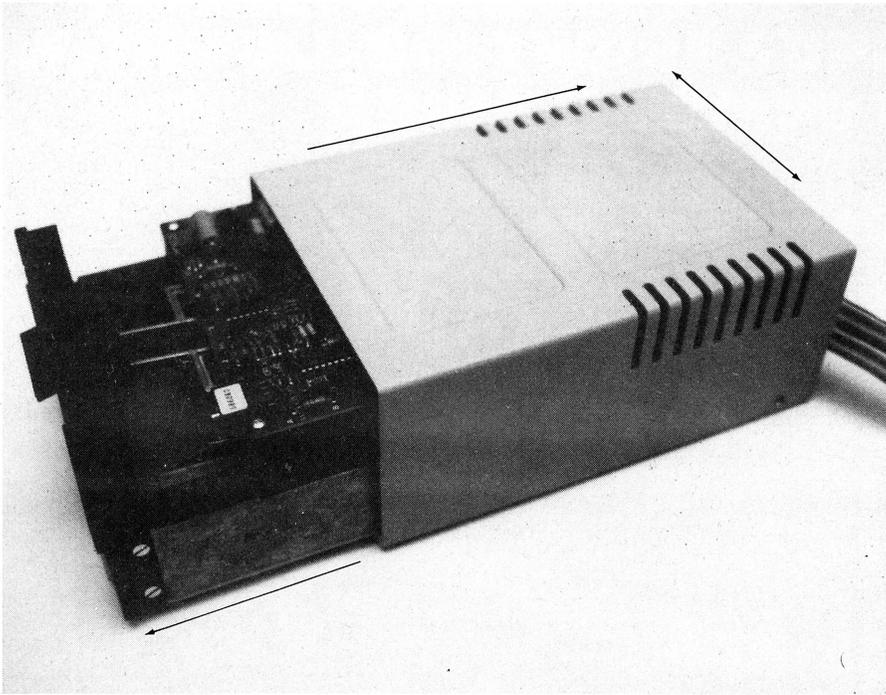


Photo #1 Sliding the cover off the drive.

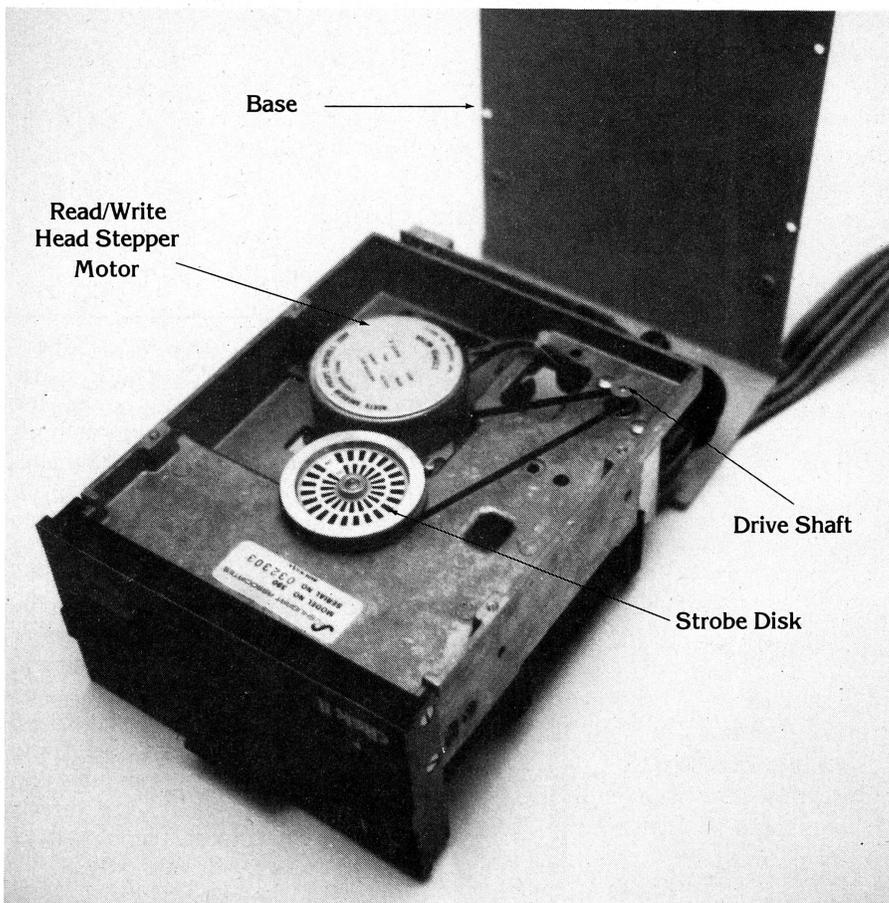


Photo #2 Underneath the base plate is a strobe disk.

cover by first removing the four Phillips screws on the bottom of the drive. It is not necessary to remove the drive's connecting cable nor is it necessary to take the controller card out of your Apple II. Slide the cover backwards while holding the base of the drive. This may feel tight—and it usually is—but gentle wiggling will allow the top to slide off (see photo 1). Lay the cover aside for the moment.

If you are following method #1 continue reading here. Method #2 continues after this section.

METHOD #1—CONTINUED.

Now turn the drive over and lay it on a folded towel to protect the printed circuits and other components. Remove the four Phillips screws (see photo 2) and lift the base upwards, hinging at the back of the drive. This will reveal a large wheel with a strobe disk attached to it.

Now insert a blank disk (one that has not been initialized) into the drive and close the door. Turn on the power to the Apple and attempt to boot the disk drive (of course, it won't—it will simply spin). Now locate the speed adjustment screw (see photo 3) and put a lighted fluorescent lamp several feet above the drive. Using the jewelers screwdriver, turn the screw SLIGHTLY until the strobe lines seem to stop moving. This is similar to adjusting the strobe on a record turntable. Guess what? You're finished!

Now turn off the power, put the base back on and tighten the four Phillips screws, slide the cover on from the rear (with vents towards the back) and put the remaining screws back. Note: there are two sheets of heavy paper glued inside the cover to seal the vents from outside dust. Often this paper will get stuck as you are putting the cover back on. Before trying, press the paper down tightly especially at the corners

METHOD #2—CONTINUED.

Locate the speed adjustment screw (see photo 3). If the screw points downward instead of to the right you will have to remove the base first (see method #1).

Now turn on the power, boot the disk speed program disk and run the test. Usually, a graphics display will show you the current speed or the amount plus or minus from 300

RPM. Adjust the screw SLIGHTLY until 300 RPM is achieved as closely as possible. That's all there is to it.

Reassemble by reattaching the base with four Phillips screws, slide the cover on from the rear with vents and cable toward the back (press the vent seal paper down against the inside corners of the cover to prevent tearing the paper as you do this).

NEXT TIME: The Easy Way

One modification that you can make to your drive (if the warranty is up) is to drill a 1/4 " hole in the cover in line with the adjustment screw (if yours points to the right) to allow adjustment without disassembling the drive each time. This is preferable since taking the drive apart is hard on it and increases the chances of accidental internal damage. See Photo 1 to locate the position of the hole. It should be centered 13/16 of an inch from the rear edge and 17/32 of an inch from the bottom edge of the cover. Remove the cover when doing the drilling and get as far away as possible from the drive itself to avoid contaminating the inside with bits of aluminum. File away all burrs before returning the cover to its proper place.

CLEANING THE READ/WRITE HEAD

The next item to discuss is cleaning the read/write head. With the power off and the disk drive cover removed (see the section on disk speed adjustment for instructions) wrap a clean cotton swab with a layer of cotton sheet or pillowcase (to avoid leaving cotton fibers behind). Dunk this in a solution such as Trichloroethane or any solvent that will ENTIRELY evaporate. THIS IS VERY IMPORTANT. Do not use alcohol in any form since there is always some residue after drying. Typewriter cleaner such as Nutype works beautifully and leaves no residue. Use plenty of ventilation while using this volatile liquid. Remove any disks from the drive. Reach down through the hole (see Photo 4) in the center of the circuit board with the wet swab and lift the black plastic arm up revealing the shiny white read/write head. Wipe the swab over this head several times, turn the swab and do it again until the head is clean. Reassemble as described in the disk speed section.

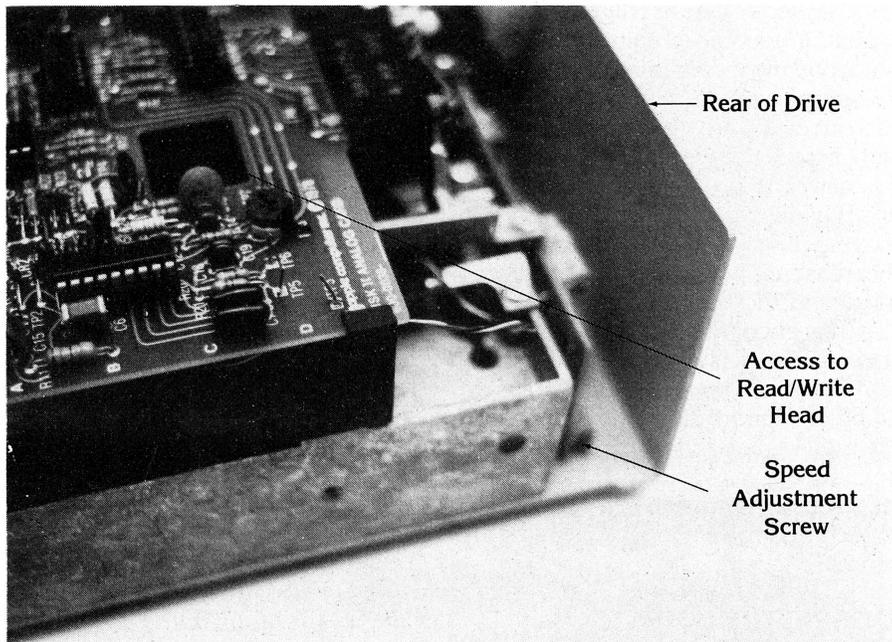


Photo #3 Speed adjustment screw and head access locations.

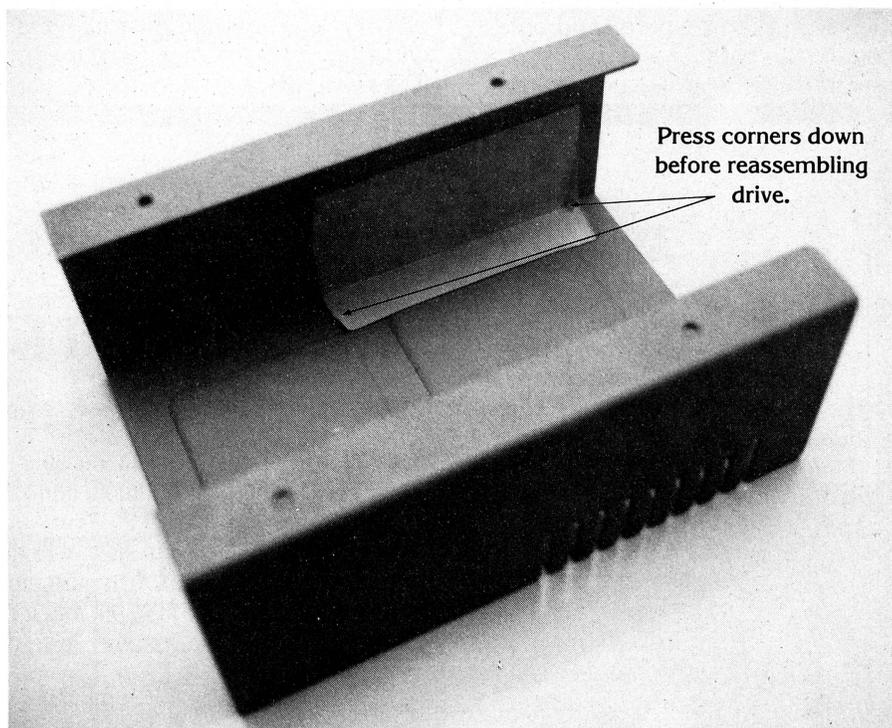


Photo #4 Paper covered ventilation holes help prevent dust contamination.

THE PRESSURE PAD

Contrary to popular belief the read/write head does not "float" above the disk as many larger, hard-disk drive heads do. In the Apple drives the disk actually touches the read/write head when the drive door is lowered. The door causes a pressure pad to lower onto the disk surface. The pressure pad gently but

firmly presses the disk against the read/write head. This helps to insure constant contact with the disk to prevent "drop outs" or loss of signal. An annoying trait of the Apple drives is that the fibre pressure pad (the black plastic arm holds it) picks up dust and oxide which gets burnished after several month's use causing the drive to "sing" while the disk turns.

This sounds like a high-pitched squeal. If you can obtain a replacement pad from your local dealer and are so inclined, you can "pop" the old pad out of the arm (a little plastic insert), scrape the old pad off and stick the new one on. For most people, this is a bit involved as it requires removing the printed circuit board. For that reason, I recommend you let the repair shop do this. Another problem you may encounter when the head is seeking a track is a squeak. This is intermittent and is caused by the plastic head support piece moving over the metal guide rods. It usually does not cause any problems but it may cause temporary insanity if you use it often. This is also a job for the repair center.

CLOSING THE DOOR— EASY DOES IT

One common "crime" against a diskette that has just been inserted into a drive is to close the drive door with a sharp—and forceful—SLAM. I have seen both "experts" and amateurs do this without even giving it a second thought. Unfortunately, do-

ing this may cause crimping of the center hole of the diskette. This is PERMANENT damage. When it happens the disk may not ever center correctly and I/O errors may result. I have one disk that was given to me that has no physical damage on it but refuses to work properly because of a terribly warped center hole. Several major suppliers of diskettes have added a centering ring or hub of self-sticking vinyl to help prevent this from happening. Even if a diskette DOES have this hub you should exercise great care in closing the drive door. If you wiggle the door up and down as you are lowering it, it will help to center the diskette before you have the door fully closed. It is a good habit to get into.

THE BOTTOM LINE

In the final analysis, it is important to remember that the Apple disk drives are, in many ways, no different than large disk systems. They require preventive maintenance and daily care. To get the most life and consistent performance from them, it is YOUR responsibility to see that

this maintenance is carried out faithfully and periodically. It is not unreasonable to check drive speed each time you sit down to use the system and monthly cleaning is probably a good idea if you use the drive daily. You'll thank yourself for doing it.

References:

Beneath Apple DOS by Don Worth and Pieter Lechner—Copyright 1981 by Quality Software, 6660 Reseda Blvd. #105, Reseda, CA 91335.

Hardcore Computing Volume 1 Number 1, Update 1.1, Copyright 1981 by SoftKey Publishing, P.O. Box 44549, Tacoma, WA 98444.

The DOS Manual, Copyright 1980 by Apple Computer Inc., 10260 Bandley Drive, Cupertino, CA, USA.

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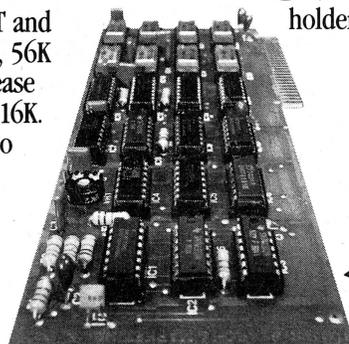
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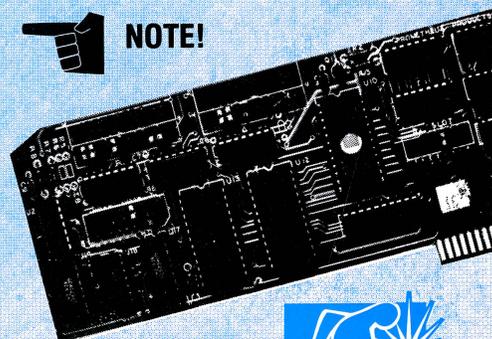
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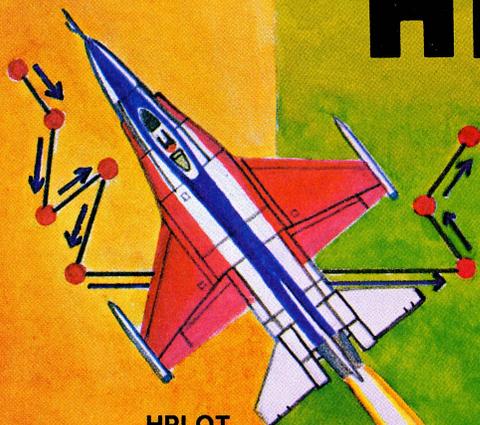
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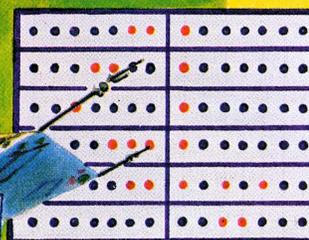
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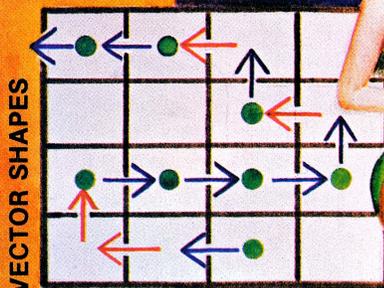


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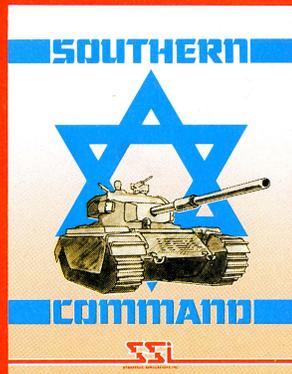
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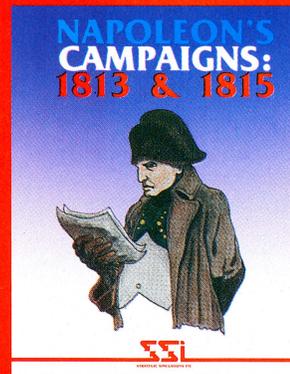
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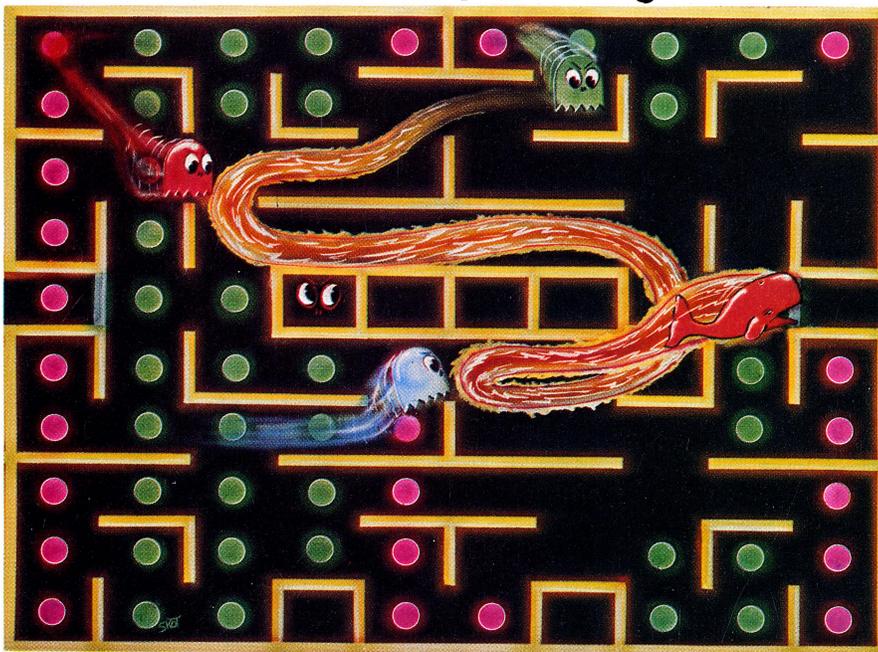
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Type Ahead Buffer. The Model 150 Type Ahead Buffer is compatible with all Apple II computers and software. Featuring a 40-character type ahead capability, the Model 150 eliminates the need to wait for computer prompts before entering the next command or data. Requires no software patches, cuts or jumpers—\$49.95. Vista Computer Company, 1317 E Edinger Avenue, Santa Ana, CA 92705 (714) 953-0523.

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Hard Cartridge Disk/Controller. Cameo Electronics' DC-500 Disk Controller is an intelligent interface which enables most eight-bit microcomputers to utilize up to four hard disk drives. Has DMA capability and an internal 512 byte data buffer. Operating systems available for the Apple II and II Plus for DOS 3.2 or 3.3, CP/M and Pascal. Controller will operate with either a Western Dynex Drive Series 6000—5 megabyte fixed and 5 megabyte removable or a Control Data Corp. Drive 9427 H Hawk (same configuration). Extra disk packs (removable) available also. Controller—\$1,500, Western Dynex drive—\$5,995, CDC Drive—\$7,995. Cameo Electronics, Inc., 16262 Clementine Street, Anaheim, CA 92802 (714) 535-1682.

Color RGB Monitor. Videotek's RGB-13 is a 13-inch RGB monitor designed for color display of text, graphs, plots, diagrams, and medical applications. The monitor features a slot mask in-line gun CRT capable of 350 lines of horizontal resolution. Has a full range analog input and a video channel bandwidth of 46 MHz. Selectable internal and external sync and audio input are standard features. \$899. Videotek, Inc., 123 York St., Pottstown, PA 19464 (215) 327-2292.

Serial Board. The ASIO board allows the user to connect serial-driven peripherals to the Apple computer. It has two 26-pin header connectors; one is for the connection of a terminal or printer, while the other is for a modem. Also provides an RS-232-C serial interface. Signals are brought to and from the board through a 12-inch cable having a DB25S connector that extends out the back of the Apple. On-board firmware is designed to accommodate a wide variety of serial-driven peripheral devices, via user-set flags that control the peripheral's operations. \$139 assembled and texted or \$109 in kit form. SSM Microcomputer Products, Inc., 2190 Paragon Drive, San Jose, CA 95131 (408) 946-7400.

BSR X-10 Interface. The Micro Commander connects a microcomputer to the BSR X-10 system. It provides an easy, inexpensive, and reliable way to control lights and appliances (motors, TV, stereo, heaters, alarms, fans, pumps, etc.) in a home or office using a microcomputer. It is a direct interface to the AC line, so there's no need to purchase the BSR command console. \$59.95. Interface Technology, Inc., P.O. Box 383, Des Plaines, IL 60018.

8-inch Disk Controller. The new LOBO Model LCA-22 double density floppy disk controller has been specifically designed to match your Apple to the new double-sided, double-density 8-inch floppy disk drives. Completely software transparent, the Model LCA-22 will plug into any chassis slot. You are no longer restricted to slot 7. Fully compatible with 3.3 DOS and PASCAL. CP/M will be available soon. Available at your local store or contact: LOBO Drives Int'l, 354 South Fairview Ave., Goleta, CA 93117 (805) 683-1576.

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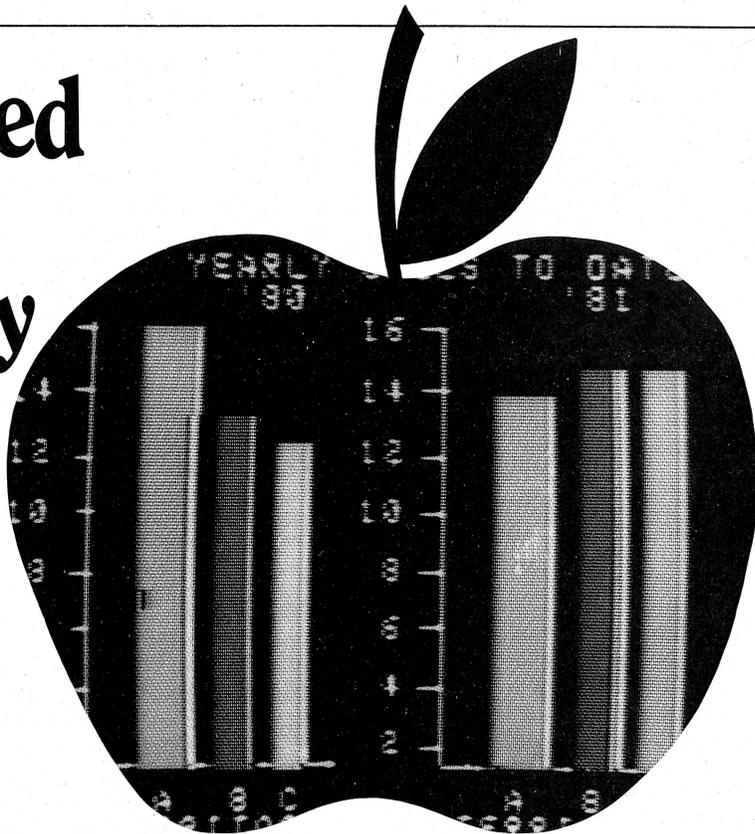
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Maintains an entire payroll for up to 125 employees. It provides numerous payroll utilities for quick and easy payroll and check generation. It has built-in Federal and State tax tables and provides some remarkable reporting capabilities. **Only \$240.**

Professional Time and Billing

Maintains time and billing data for up to 300 clients. 120 rates (employees) can be on file at any time. Rates may appear as time/expenses/fees. Prints statements on available forms. Generates a variety of transactions and activity reports, and much more. **Only \$325.**

Apartment Management

Maintain financial and managerial data for up to 6 separate apartment complexes. Each complex can contain a maximum of 120 units and 8 different types of units. Generates an operating statement which contains YTD rental income, security deposits, pet deposits, pool deposits, misc. deposits, damage amounts, allowances, expenses and a complete breakdown of apt. units by type. Again, some great reports. **Only \$325.**

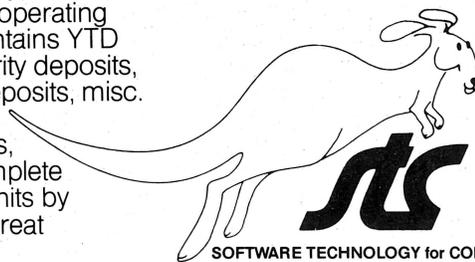
Early Bird Offer

If you purchase any one of these programs from your STC dealer within the next 30 days, we'll let you have our new and quite fantastic Coloring Board package for only \$30. This program, normally costing \$60, compares with some hardware capabilities costing \$800 and more. It allows you to quickly create, store and display all types of graphics and text labeling. For example, a bar-chart like the one shown above for display at sales meetings. In short, it has unlimited useful applications for business.

Act now. Contact your local STC dealer for details on this extremely unusual offer. And be sure to check out the rest of our great line of software packages as well.

Dealer inquiries invited.

(Apple is a trademark of Apple Computer Company)



SOFTWARE TECHNOLOGY for COMPUTERS
P.O. Box 428, Belmont, MA 02178 (617) 923-4334

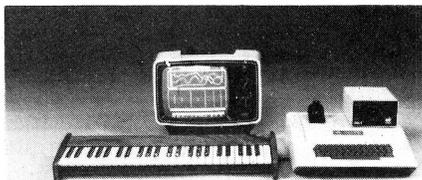
PROMS, or even 2K RAM chips in each of the two memory sockets. Two 2732 PROMS allow a total of 8K of memory on the Board—\$125. Andromeda, Inc., P.O. Box 19144, Greensboro, NC 27410 (919) 852-1482.

32K Memory Board. The Saturn Systems 32K board comes with software that will automatically relocate DOS into one of the two 16K banks on the board. Also adds alternate programming language (Integer or Applesoft) in the other 16K bank. That gives you a full 48K with which to program. Compatible with Pascal, Fortran, Pilot and other languages available for the Apple II, and the Microsoft CP/M and Z-80 SoftCard. Increases VisiCalc memory an additional 9K—\$239. Computer Data Services, P.O. Box 696, Amherst, NH 03031 (603) 673-7375.

64K RAM Board. Legend Industries, Ltd., announces the first 64K RAM Card for the Apple computer. It is directly compatible with the Language Card, and by bank switching 16K banks of RAM over the Apple's existing ROM space the Apple can access double its own RAM space. Gives you 64K of RAM in addition to the 48K of RAM in the Apple giving a total of 112K. When the card is selected it takes the place of the Apple's D000-FFFF ROM space. Easily installed and fully compatible with existing software for 16K boards. Loads with an alternate language (Applesoft or Integer) and/or The Disk Operating System. \$349. Legend Industries, P.O. Box 112, Pontiac, MI 48056.

MUSIC

Sound Effects Card. Noisemaker II features a full sound effects IC, audio amplifier, I/O port and connects to the speaker in the Apple. Functions under software control. Adds sound effects to your programs for the Apple II. Ackerman Digital Systems, Inc., 110 N. York Road, Suite 208, Elmhurst, IL 60126 (312) 530-8992.



Synthesizer System. The Soundchaser computer music system transforms the Apple II into an expandable, professional quality, polyphonic keyboard synthesizer and sequencer. Sound-

chaser's music modules include a 4 octave keyboard housed in an attractively finished wood cabinet complete with polyphonic interface card, connector and control software. The synthesizer voice card provides 3 analog/digital hybrid, studio quality programmable synthesizers. Each synthesizer consists of a wide range waveform select oscillator, digitally controlled 24 dB/octave, low pass resonant filter, user definable LFO, fully programmable envelope generators, and a digitally controlled amplifier. System software includes a 4 channel sequencer which supports up to 12 synthesizers. Keyboard—\$650, 3 voice synthesizer card—\$350. Passport Designs, P.O. Box 478, La Honda, CA 94020 (415) 747-0614.

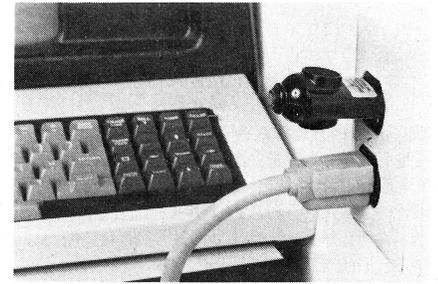
MUSIC CARD

9 Voice Synthesizer Board. Nine-voice music card with stereo output uses only one slot in your Apple. Utilizes new state-of-the-art LSI Sound Generation devices. Price includes a demonstration diskette and a conversion program allowing the Music Machine to be used with ALF music program (not supplied). Completely assembled and tested—\$129.95. Vista Computer Company, 1401 Borchard Street, Santa Ana, CA 92705 (714) 953-0523.

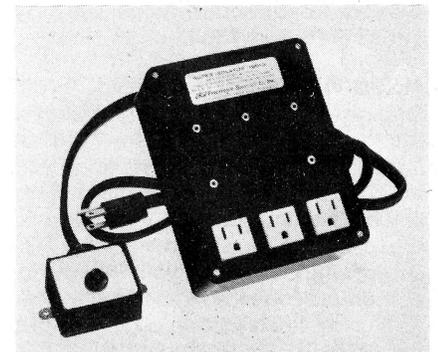
POWER CONDITIONING

Surge Protectors/Filters. Four line protectors offer varying levels of protection for users of electronic equipment. The "Plum," an EMI-RFI filter provides 15 Amp quiet power—\$49.50. The "Lemon," a surge protector provides 1440 Amps protection for $\frac{1}{120}$ second at 25 degrees C—\$59.95. The "Lime" is similar to the "Lemon" but has a six-foot three-wire grounded power cord and an On-Off switch—\$89.50. Top-of-the-line model, the "Orange" is both an EMI-RFI filter and surge protector with power cord and switch—\$139.95. Electronic Protection Devices, Waltham, MA.

Power Backup. RAMLOK, a computer equipment protection system, guarantees that equipment will receive 115V AC plus or minus 10 percent. Response time to complete voltage failure is within 20 ms, when RAMLOK will switch to a standby power source, such as a battery/inverter combination. The length of standby power operation is typically from 2 to 20 minutes. RAMLOK will also filter line voltage with a dual T-section RFI filter to control pulse, continuous, or intermittent interference. \$495 from Ladco Development Co., P.O. Box 464, Olean, NY 14760 (716) 372-0168.



Surge Protector. A new voltage surge and transient suppressor has been announced for \$29.95. The Suppressor electronically removes or greatly reduces sudden voltage changes which could affect the performance or catastrophic failure of sensitive electronic equipment, such as small computer systems. Solid-state semi-conductors clip all overvoltage surges beyond 132 VAC, and a passive filter network snubs high frequency transients which might occur anywhere over the full input voltage waveform. Cuesta Systems, Inc., 3440 Roberto Court, San Luis Obispo, CA 93401 (805) 541-4160.



Remote-switched Filters. Remotely switched ISOLATORS announced by Electronic Specialists are the newest addition to their popular patented Isolator Filter/suppressor line of interference control products. The remote AC power control switch can be mounted near the equipment operator for convenience and system cable neatness. Load capacity is 1,875 watts maximum with each socket capable of handling a 1KW load. Prices start at \$79.95. Electronic Specialists, Inc., 171 South Main Street, Natick, MA 01760 (617) 655-1532.

PRINTERS/PLOTTERS

Flatbed Plotter. A new line of flatbed plotters offers multi-pen capability and intelligent operation. Easily interfaced to popular microcomputers via RS-232, DPIB-IEEE-488, or Parallel 8-bit ASCII connections. Prices range from \$1,400 (14x10 inches plotting area—2 inches

per second plotting speed one pen) to \$5,750 (15×10—15.7 inches per second, 10 pens). Uses almost any pen(s). Programmable function commands include such commands as DRAW, RELATIVE DRAW, PRINT, MARK, CIRCLE, CURVE, LINE, FONT, GIN, CLEAR, HOME, CHART FEED, NEW PEN, AXIS, HATCHING, ETC. Watanabe Instruments Corp., 3186-D Airway Avenue, Costa Mesa, CA 92626 (714) 546-5344.

Typewriter Conversion. The Dynatyper is now RS-232 serial, Centronics parallel, IEEE 488 (GPIB) and 15 Pin Current Loop compatible via the Dynastar. The Dynastar/Dynatyper system is turnkey compatible with Apple computers (and many others). Features include a 3.5K RAM buffer, 37.5 to 9600 switch selectable baud rate, top of form option, 80 or 132 column option and downloading capability to 4 special character sets. Print speed is 12 CPS for IBM Selectrics and 8 CPS for all other standard keyboard typewriters. No modification is necessary to the typewriter and manual operation can be resumed in 5 seconds—\$699. Rochester Data, 3000 Winton Road South, Rochester, NY 14623 (716) 244-7804.

MX80/MX70 Friction Feed. From Orange Micro, Inc., comes a high quality friction feed kit for your Epson MX80 or MX70. The kit allows the user to convert his/her Epson printer to a friction feed and pin feed mechanism. It uses a solid rubber platen for perfect tracking. Will accept single sheets of your letterhead, or multiple copy forms such as invoices with up to 4-part carbon copies. Allows the use of 9½ inch wide continuous fan-fold paper. No drilling—initial installation takes about 30 minutes. All parts included with easy instructions. Orange Micro, Inc., 3150 E. La Palma Suite G, Anaheim, CA 92806 (800) 854-8275 or in CA (714) 630-3322.

Bidirectional Printer. Microtek micro-processor-controlled printers contain a 240-character buffer, expandable to 3K in 1K increments. Supports the full upper and lower case 96 character ASCII set in three software selectable fonts (5, 10 and 16.5 characters per inch) using a 9×7 dot matrix. They can handle up to three copies plus the original. A comprehensive self-diagnostic program is automatically run on power up. Print head life expectancy is 100 million characters. Pin feed is adjustable to accept fan-fold forms from 1 to 9.5 inches in width. Model MT-80P Centronics-compatible parallel interface version is priced at \$795 in single quantities; the model MT-80S serial (RS-232) version costs \$895 for single units. Microtek, Inc., 9514 Chesapeake Drive, San Diego, CA 92123.

MISCELLANEOUS

Clock/calendar. Superclock II is a complete, low-cost clock calendar system for the Apple II. On-board PROM firmware allows the clock to be read with simple BASIC statements. The Apple Clock Emulation mode means that virtually all software written for other clocks will work without any modification. Superclock II can generate interrupts at one or more of the following intervals: 1 msec, 1 sec, 1 min, 1 hour. Full Pascal support, SuperDOS adds the security and convenience of dated files. Full battery operation. Complete system includes Superclock II, BASIC Demo Disk, Pascal Utility Disk, Interrupt Demo Disk, Super-DOS—\$159. Clock alone \$99.95. Items available separately. West Side Electronics, P.O. Box 636, Chatsworth, CA 91311 (213) 884-4794.

Speech Recognition Board. With the Heuristics H2000 speech recognition board, you can train your Apple computer to recognize 64 words or phrases of your choice (or multiple thereof). Microphone included with optional head-set—\$275. Heuristics, 1285 Hammerwood Avenue, Sunnyvale, CA 94086 (408) 734-8532.

Workstations. State-of-the-art workstations complete your individual computer system hardware. Not a table, bench or desk, but a uniquely designed quality unit. Combining its contemporary styling with high strength and light weight, these workstations have an attractive, clean feeling, easy-care dark walnut finish; other fine finishes are available to meet your personal taste. The basic unit plus a left- or right-hand return provide ample working area. Easily assembled/disassembled in minutes with only a screwdriver, allowing portability via the family car. Casters (some toe-locking) are an alternative to the adjustable floor glides. Basic unit \$264.50, return \$154.50, hobbyist model \$99.50. Coordinated Services, 10025 Canyon Road East, Puyallup, WA 98371 (206) 531-1053.

Speech Recognition System. The VET/2 is a speech recognition device consisting of a hardware preprocessor and a software driving routine. The software package provides all functions for training and recognition. Vocabulary "words" may be up to 1.5 seconds in duration and up to 20 characters long. The template area for a forty word resident vocabulary requires about 4600 bytes. The control software requires approximately 6000 bytes for a total of 10.6K memory required in the host computer. Saves vocabulary sets to disk or retrieves them. The Keyvet features makes voice input appear to the Apple as though it came from the keyboard. In other words, voice and keyboard input

may be used interchangeably. This means that existing software can be run without modification. Easily accessible from either BASIC—\$900 with manual. Includes VET/2 preprocessor, Software and demonstration programs, Operation manual and Noise cancelling microphone. Scott Instruments, 815 North Elm, Denton, TX 76201 (817) 387-9514.

Game I/O Adapter. Paddle-Adapple is a small printed circuit board which plugs into your game I/O socket and sticks on to the outside of your Apple. Permits fast changing of paddles, joysticks, etc. Jumper socket allows you to configure the Paddle-Adapple to meet your specific needs. Use four paddles simultaneously, invert X or Y axis of joysticks, four pushbutton inputs. All strobes, annunciators, and power lines available on both connectors—\$29.95. Available from your local dealer or contact Southern California Research Group, P.O. Box 2231, Goleta, CA 93118 (805) 685-1931.

Video Digitizer. The DS-65 Digisector is a random access video digitizer which converts a TV camera's output into digital information the Apple can process. It features 256×256 resolution with up to 64 levels of grey scale. Scanning sequences are user programmable. On-board software in EPROM is provided for displaying digitized images on the Hi-Res screen. Software available includes Portrait System that includes captions and a credit line, reverse printing for T-shirt application and the option to save portraits on disk; Picture Scanner, provides a variety of different dithering algorithms for compressing the digitized image into the Hi-Res screen. DS-65 \$349.95, Camera—\$299 or both for \$599. Write for software prices. The Micro Works, P.O. Box 1110, Del Mar, CA 92014 (714) 942-2400.

Software

BUSINESS/EDUCATIONAL

Job Cost Accounting. Job Cost Accounting program provides a job cost ledger with actual income and expense, budgeted income and expense, budgeted/actual comparison, actual/budgeted percentage, cost overruns highlighted with special arrow. Automatic balance sheet, income statement, general ledger, complete entry journals for cash, checks, receivables, payables, journal entries. A check writer that permits all or a portion of the check transactions being printed at the user's option. Transaction history for each job item. Kleinhammer Business Software, P.O. Box 1065, Morro Bay, CA 93442 (805) 772-2766.

Statistics Package. HSD STATS is a menu driven statistics package which accepts 7 samples of 200 points each. The package offers descriptive statistics, 10 data transformations, frequency distribution, percentile ranks and points, 1 or 2 variable Chi-Square, Correlation Matrix for up to 7 variables, 3 t-tests; file creation from single or combined samples, arithmetic inter-sample manipulations, printing or raw data and results, Hi-Res bargraph and scattergram—\$99.95. Includes disk and 3-ring binder with documentation. Human Systems Dynamics, 9249 Reseda Blvd. Suite 107, Northridge, CA 91324 (213) 993-8536.

Reading Skills Instruction. Compu-Read 3.0 contains a series of instructional modules which build learner's skills by strengthening the perceptual processes essential to competent reading. \$29.95 includes documentation. Edu-Ware Services, 22222 Sherman Way, Suite 203, Canoga Park, CA 91303.

Educational Software. Educational software for the Apple II includes Elementary Math, History & Geography, Grammar, Business (amortization, reconciliation, stock market simulation, depreciation, chart of accounts, journal entry), Farm Management (with full double entry), Temperature Drill, Number Reading, Number Comparisons, Money Counting, and Change Maker. Micro Learningware, P.O. Box 2134, N. Mankato, MN 56001 (507) 625-2205.

Insect Identification. Orderident is a multiple entry key to orders of insects. It is an interactive computer program to help students identify insects and stimulate interest in insect biology. Can identify any North American insect to one of the twenty-six orders in the Class Insecta. Will lead the student step-by-step through a series of questions until an identification is obtained. Permits repeated attempts, if needed, with no more than a "yes/no" response required. Complete self-prompting with easy to understand instructions at key points. Full documentation including a sample run—\$44.95 on diskette plus \$1.50 for shipping and handling. Educational Computing, 3144 Valentino Court, Oakton, VA 22124.

CAI. Aviculturist II Bird Classification Program, allows the user to identify birds of more than a thousand species. Program retrieves name of bird, classification, size in inches, diet, nest site and number of eggs. Bird watchers can also store their findings, to retrieve and compare—\$50 with a complete data listing of more than a thousand American birds. American Avicultural Art & Science, 3268 Watson Road, St. Louis, MO 63139 (314) 645-4431.

Math Instruction. Mathware works through carefully constructed questions that produce conceptual understanding. It works through immediate, accurate feedback. System H—designed for use at home stores all records, controls correct difficulty level. Has 5 disks for addition & subtraction, multiplication & division, fractions concepts, decimal concepts, percents, ratios and negatives. System S—designed for use by schools has all the features of the System H plus has system storage for 50 students, diagnostic tests, automatic concept selection based on test results. Requires 48K with Applesoft ROM and disk drive. System H—\$59 per disk. System S—\$350 for entire 8-disk system. See your dealer or contact Mathware/Math City, 4040 Palos Verdes Drive North, Rolling Hills Estates, CA 90274 (213) 541-3377.

Payroll. Payroll program permits personnel records for 100 employees. Prints checks, W-2 forms, quarter and YTD earnings. Includes such features as security passwords, Local/City, State and Federal tax, standard or optional pay periods, salary or hourly pay, commissions, disability insurance deductions, handwritten check entry, payroll summary, employee master list, check register, payroll register and General Ledger listing—\$250. Other modules available separately at \$250 each include General Ledger, Accounts Receivable, Accounts Payable, and Property Management. All may be used as stand-alone systems or as part of an integrated system. Continental Software, 12101 Jefferson Blvd., Culver City, CA 90230 (213) 371-5612.

Records Management. Apple Record Manager is an extremely rapid record-management system. Record structure is very flexible. Permits up to 20 fields with user-defined headings and records up to 255 characters long. Files may be stored on the same disk as the master program or on another disk, either on the same drive, or a second drive. A built-in copy program allows production of back-up disks, as soon as the program is exited, \$35. Requires 48K Applesoft ROM and disk drive. Also available: Apple Literature Database. Accumulation of 5 years of Apple literature references through 1980. Covers over 60 publications. Either desired search-word at the keyboard and it searches the disk for all references. Supplementary update for 1981 available July 1, 1982. \$60—requires Applesoft ROM, 48K and disk drive. Connecticut Information Systems Co., 218 Huntington Road, Bridgeport, CT 06608 (203) 579-0472.

Real Estate System. Search through up to 3,600 property listings with Real-Soft programs for Real Estate Agencies. No need to flip through endless pages of listings to find that "just right" property. Simply have your client specify the price range, number of bedrooms, preferred geographical location, acceptable house styles and up to 12 additional listing features. Real-Soft programs will find the right properties quickly and impressively giving you more time to view the selected properties and close the sale. Up to 10 different house styles, 12 different listing features and 16 different areas. Requires 48K Apple II, 2 disk drives and monitor. Printer is optional. Includes powerful set of programs including a Property Availability Report, full Mortgage Amortization Tables (American OR Canadian method), and a Mortgage Comparison Analysis Report. Available at your local dealer or contact Real-Soft, 1450 West Georgia Street, Vancouver, B.C. V6G 2T8 Canada (604) 669-2262.

Financial Management. Enter an entire month's checking, charge card, and cash accounts in just a few minutes using your own personalized macro lists. Instant entry error correction. Audit all files by code and month with year-to-date totals. Perfect for tax accounting. Self-prompting, error avoiding entry. Automatic date, coding and numbering. Screen and printer routines for listing files, balance, reconcile, search, and audit reports. Configure system to match almost any printer. Budget manager to play, review and balance your budget. Search all files with specific and expanded searches. Requires 48K with ROM Applesoft and disk \$39.95. D.R. Jarvis Computing Inc., 1039 Cadiz Drive, Simi, CA 93065 (805) 526-0151.

Project Management. Milestone is a low-cost project management software package designed to operate with CP/M 86. Useful in smaller projects commonly encountered in business, government, engineering and construction, where the project can be broken into a series of distinct tasks. It automatically lays out each job against a time scale showing which tasks are critical and which can be delayed. It also displays the manpower and expenses versus time, as well as the totals and project completion date. The original data can be altered during a project to reveal the impact of any scheduling changes. Available for the Apple using CP/M 86, CP/M or UCSD Pascal. It requires an 80 x 24 screen and 56K bytes of RAM. \$295. Organic Software, 1942 Windsor Way, Livermore, CA 94550 (415) 455-4034.

(continued on page 81)

International Apple Core—Order Form

(See President's Message for more information about products.)

SPECIAL ITEMS

INIT USER GROUP BINDER—\$50.00 _____
 IAC LAPEL PIN—\$3.00 each _____

SOFTWARE FOR APPLE II

IAC Disk #0—\$8.00 each _____
 IAC Disk #1—\$8.00 each _____
 IAC Disk #2—\$8.00 each _____
 IAC Disk #3—\$8.00 each _____
 IAC Disk #4—\$8.00 each _____
 IAC Disk #5—\$8.00 each _____
 #6 Pascal Attach Bios Disk: \$7.00 _____
 IAC Disk #7—\$8.00 each _____
 IAC Disk #8—\$8.00 each _____
 IAC Disk #9—\$8.00 each _____
 IAC Disk #10—\$8.00 each _____

SOFTWARE FOR APPLE III

File Cabinet—\$10.00 _____
 RS232 Driver—\$10.00 _____
 Thunderclock Driver—\$10.00 _____
 DOS to SOS Converter—\$10.00 _____

PAST ISSUES OF ORCHARD

Volume 1, No. 1—\$5.00 each _____
 All other issues—\$3.50 each _____

TOTAL FROM ABOVE

Out of USA add 20%—Air _____
 California add 6½ % tax _____

GRAND TOTAL

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plus Address Book™

Stores names, addresses, and telephone numbers and prints mailing labels. Has user-definable category system. \$49.95

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 for the Apple II or II Plus**



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 (301) 659-7212

Apple II is a trademark of Apple Computer Corp.

Call or write for information and the name of your nearest MUSE dealer

(continued from page 79)

Inventory Control. Stockfile handles inventory, point of sale, order entry, and bill of materials. Holds up to 9486 different stock items, accesses any item in less than two seconds, and comes with a complete report generator. Multi-user capabilities allows up to five apples to be connected together, all accessing the central Stockfile data base. Uses 2-4 disk drives and any printer with a standard interface. Holds up to 1750 customers. Removes items sold from stock automatically. Customer receivables are provided, with 30, 60 and 90 day aging. Complete cash register facilities are included: cash balancing, invoices, packing slips, discounts, taxes, and returns. Complete sales analyses, broken down by products category, sales-person, price and customer. Calculates commissions, assesses returns, and enables you to determine how your business is progressing. Price not available. Solidus International Corporation, #204, 4202 Guide Meridian, Bellingham Business Park, Bellingham, WA 98226.

General Ledger. Businessmaster General Ledger is an easy-to-use and low cost system for storing home or small business financial records. Balance accounts with ease. Make tax time a breeze. Has been tested to be one of the easiest programs to use with the highest professional results. Menu driven; full account control; automatic error checking; five professional report formats; screen or printer display; works with most printers; requires just one disk drive—\$79.95. Also available is the Accounts Receivable/Accounts Payable program for just \$79.95. Order both for \$149. Businessmaster, Inc., 6443 Coleman Road, E. Lansing, MI 48823.

Medical Billing System. Med-Apple is a billing system for one to 10 physicians. It can handle 7000 accounts and 2000 transactions per billing period. Medicare, Medicaid, Medi-Cal and Blue Cross forms are filled out at the touch of a key. Reports can be generated at any time to show physician activity for amounts billed and cash receipts. Exclusive to the system, the developer says, is a cash-to-carry feature that allows the physician to bill certain patients for only that amount not covered by their insurance company. The system also makes patient lists and prints mailing labels. Requires an Apple II Plus (48K) with three disk drives or the Apple III with a Corvus hard disk. Price not given. Medical Software, 3604 Foothill Blvd., La Crescenta, CA 91214 (213) 248-2884.

Financial Package. Micro-DSS/FINANCE provides full-scale financial analysis, reporting, and color graphics on the Apple. Functions include IRR, NPV, depreciation, amortization, tax

loss carry-forward, tax table lookup, consolidation and more. Built-in color graphics you can save for later business presentations. Flexible report writer lets you custom design financial reports and an editor makes it easy to create—and change—models, data and reports. Ideally suited for “what if” analysis and alternative scenarios that until now have been difficult to achieve on a micro-computer. \$1500. Computer Software Marketing, Addison-Wesley Publishing Company, Reading, MA 01867.

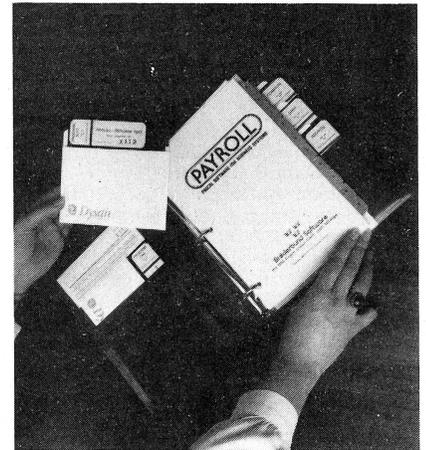
BUSINESS

Payroll. A new payroll system has been released for use on the Apple II Plus or Apple III microcomputers. Handles up to 199 employees on a single or dual-drive disk system, and can calculate weekly, bi-weekly, semi-monthly, and monthly payrolls for fixed-salary, hourly, piece-work, or commissioned employees or any combination thereof. Calculates both simple and complex-formula deductions for all Federal taxes, Social Security, three state taxes, three local taxes, and six miscellaneous deductions. The system uses the NEBS 9000-1 standard paycheck, and operates on nearly all printers. Available at your local dealer or contact Alternative Software, Inc., 1165 Barbara Drive, Cherry Hill, NJ 08003 (609) 428-6701.

Energy Management Assessment. Energy software is offered for engineers, designers, builders, etc. Passive solar design: direct gain, sunspaces, trombe and water walls. Los Alamos SSF correlation model with economics computerized—\$295, Hourly simulation models for assessing building energy load dynamics and economics of passive design—\$395, a 2-dimensional overhang shading design program—\$195, Correlation of a building's energy bills and weather for conservation assessment—\$295, Building surface insulation optimization and economics package—\$195. Londe, Parker, Michels, 7438 Forsyth, Suite 202, St. Louis, MO 63105 (314) 725-5501.

Accounting System. Accounting Plus II brings to the Apple a completely integrated, easy to use accounting system. Doesn't require any special hardware, only 48K of RAM and two floppy drives or hard disk. Organizes and streamlines your paper flow and generates checks, invoices, statements and purchase orders on pre-printed forms. The system supports a solid audit trail. Modules include General Ledger, Accounts Receivable, Accounts Payable, Inventory with purchasing. Contact Systems Plus, Inc., 3975 East Bayshore, Palo Alto, CA 94303 (415) 969-7047.

Appointment Calendar. The Appointments program package allows the user to manage an appointment book using the Apple II computer. Appointments may be viewed directly on the monitor screen or listed on a printer. One day of appointments is visible on the screen which may be scrolled up or down in order to view the entire day. Flexible formats permit user definable starting and ending times, easy updating, searching by name, commenting—\$60. Andent, Inc., 1000 North Avenue, Waukegan, IL 60085 (312) 244-0292.



Payroll. A new payroll program has been released employing Apple Computer Company's "Run Time Module." This allows programs written in Pascal to be run on an ordinary Apple II with DOS 3.3 without a special language card. The payroll has a capacity of 300 employees, 15 Divisions, and 30 deduction types. It computes all Federal and State income taxes plus other state and local taxes for all 50 states. Tax formulas are built in and need not be entered by the user. Update is provided at low cost. Prints checks, check register, W-2 forms, all quarterly and summary reports and more. Requires two disk drives—\$395. Hard Disk version available (700+ employees, 63 Divisions, not "run time"). Broderbund Software, P.O. Box 3266, Eugene, OR 97405 (503) 343-9024.

COMMUNICATIONS

Talking Apple. The Voice gives the Apple II the power of speech. The voice's built-in vocabulary allows expression of many combinations of phrases, or the user can enter his own vocabulary and make the 48K Apple say anything. Floppy disks store up to 80 words or phrases that can later be sorted for quick reference. Allows any BASIC program to speak by using PRINT statements—\$39.95 from Muse Software, 330 N. Charles Street, Baltimore, MD 21201 (301) 659-7212.

FORTH-79

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FEATURES	OURS	OTHERS
79-Standard system gives source portability.	YES	_____
Professionally written tutorial & user manual	200 PG.	_____
Screen editor with user-definable controls.	YES	_____
Macro-assembler with local labels.	YES	_____
Virtual memory.	YES	_____
Both 13 & 16-sector format.	YES	_____
Multiple disk drives.	YES	_____
Double-number Standard & String extensions.	YES	_____
Upper/lower case keyboard input.	YES	_____
LO-Res graphics.	YES	_____
Z-80 CP/M Ver. 2.x & Northstar also available	YES	_____
Affordable!	\$99.95	_____
Low cost enhancement options:		
Floating-point mathematics.	YES	_____
HI-Res turtle-graphics.	YES	_____
Data Base Management System.	YES	_____
Apple DOS/FORTH-79 file transfer.	YES	_____
Modem file transfer utilities.	YES	_____

FORTH-79 V.2 (requires 48K & 1 disk drive) \$ 99.95

ENHANCEMENT PACKAGES FOR V.2:

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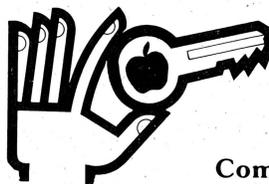
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EDIT FEATURES	MACRO-SCED	P.L.E.
Edit commands usable within a program	YES	-
Edit commands in system monitor	YES	-
Warning bell for long Basic line	-	YES
Incorporate statements from another line	YES	-
Save cursor position on screen	YES	-
Non-flashing cursor option	YES	-
Edit screen text other than Basic program	YES	-
OUTPUT CONTROL		
List one screen page at a time	YES	-
Slow-list in both Basics	YES	-
KEYBOARD-MACROS		
Editing commands within a macro	YES	-
Automatic chain to another macro	YES	-
Macros available in edit mode	YES	-
LOWER CASE CAPABILITY		
Lower Case entry from keyboard	YES	YES
L/C mode on/off also under program control	YES	-
OTHER FEATURES		
Dump screen contents to printer (in edit mode or under program control)	YES	-
Search/Replace any string in FP Basic program	YES	-

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Conferencing Utility. First Edition, by the CommuniTree Group, is a computer conferencing software package with general data and "electronic mail" features. Designed to run on an Apple II or Plus with 48K of memory, one or more disk drives, and a Hayes Microcomputer Products MicroModem, the system allows users to enter and retrieve messages via regular phone lines using a computer or terminal and a standard 30 cps or 10 cps modem. Maximum message length is 50 lines or 80 characters, with up to 320 different messages, depending on available disk space. \$95. CommuniTree Group, 470 Castro Street, Suite 207-3002, San Francisco, CA 94114 (415) 474-0933.

GRAPHICS

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Graphics for Laboratories. The Scientific Plotter draws professional-looking graphs of your data. You choose your data format, length and position of axes, 20 symbols, error bars, labels anywhere in 4 orientations. Includes five demos on disk with 30-page manual—\$25. Visi-chart provides fast plots of 4 data sets with scrolling in 4 directions, zoom scaling on X and Y axes, 2 types of graphic cursors and on-screen status report. Plots A/D input while sampling, simple commands to add, subtract, multiply, divide, integrate, differentiate, average or normalize. Ideal for spectra, chromatograms, rate curves. Includes sample data on disk with 28-page manual—\$75. Curve fitter selects the best curve to fit your data. Scale, transform, average, smooth, interpolate (3 types), least squares fit (3 types), evaluate unknowns from fitted curve. Includes five demos on disk with 33-page manual—\$35. All three programs on one disk—\$120. At your local dealer or contact Interactive Microware, Inc., P.O. Box 771, State College, PA 16801 (814) 238-8294.

Hi-Res Secrets. Hi-Res Secrets includes block shapes for Applesoft or machine language, Hplot Shapes, Vector Shapes. Covered are animation of many types,

including logical shift, XDRAW, Page-flipping, instant graphics and shape drawing programs, machine language animation for all types of shapes, font programs, machine language sounds, Hi-Res scrolling, color animation, write, record and play music, Hi-Res color palette, paintbrush and color-fill programs—\$125. Includes 4 disks, over 200 pages of documentation. Requires Applesoft in ROM, 48K DOS 3.2 or 3.3 and disk drive. Demo disk—\$10. Avant-Garde Creations, P.O. Box 30160, Eugene, OR 97403 (503) 3043.

Graphics Screen Dump. Grafpak. MX100 allows you to dump either Hi-Res page horizontally at 1x or 2x, and vertically at 1x-4x. Dump both pages in perfect registration vertically at 1x-4x. Use normal or inverse inking, specify indent in inches. Compatible with most current I/O cards. Easy to use. Grafpaks available for Anadex, Integral Data Systems, and other Epson printers. \$44.95 from SmartWare, 2281 Cobble Stone Court, Dayton, OH 45431.

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LANGUAGES

TransFORTH II. TransFORTH II is an extended, fully compiled version of the FORTH language. It features floating point arithmetic, transcendental functions, strings and arrays, Hi-Res and Lo-Res graphics and Turtlegraphics, and music. \$125 includes disk and manual. Insoft, 259 Barnett Road, Unit #3, Medford, OR 97501.

BASIC Compiler. For Integer BASIC, here is a compiler that extends the scope of Integer by removing many programming restrictions found in Apple's version of the language. Produces either pure GSL code or mixed 6502 and GSL code. String length up to 32767 characters, 16-bit signed arithmetic, standard DOS 3.3 commands, adds CHR\$(), GET(), KEY(), Hi-Res Point, Line and Shape commands. Once compiled, Integer BASIC programs will run on any Apple II. \$149.50 from Galfo Systems, 6252 Camino Verde, San Jose, CA 95119 (408) 226-2377.

FORTH-79. FORTH-79 conforms to the international FORTH-79 standard. It is suited for data acquisition, process control, animation, and video games. Comes with a screen editor and macro-assembler, and vocabularies for strings, double-precision integers, low-resolution graphics, and modem communications. The operating system allows for multiple disk drives and is 13 or 16 sector disk compatible. Requires 48K—\$89.95 from MicroMotion, 12077 Wilshire Blvd., Suite 506, Los Angeles, CA 90025 (213) 821-4340.

Assembler Teacher. This Apple program will teach you assembler language. Draws maps of memory, shows your CPU running it in slow motion on your screen so you can see exactly what the operations are doing to the registers and the stack (a great debugging tool). Exposes the mysteries of hexadecimal, two's complement, character and other data representations, instantly translating from any version to all others. Gives you the concepts you need to cope with assembly language, using simple one-line lessons. Written by a Ph.D. in computer science who regularly teaches assembler—\$44.95. Assembler Teacher, Computer Works, Inc., 789 East Market Street, Harrisonburg, VA 22801 (703) 434-1120.

Assembler/Text Editor. Clone Software has released their new Assembler and Text Editor for the Apple II computer (48K and two disk drives required). You get both a disk-based line-oriented text editor, and a 6502 Assembler. The text editor is a separate program and can be used for other purposes than editing source code for the assembler. The source code for the editor and assembler are available on disk (sold separately), so you can modify them for your own requirements. Clone Assembler includes documentation and a 13-sector disk—\$39.95. Clone Software, 1446 Estes Street, Lakewood, CO 80215 (303) 234-0630.

Applesoft Compiler. The Expediter II is an Applesoft Compiler. Takes your Applesoft programs and turns them into fast machine-language versions. Permits sharing variables between modules and calls from ordinary Applesoft programs. Allows compiling programs too large to fit into memory by breaking them down into separately compilable modules with common variable space. The user may protect up to ten areas of memory—selected at compile time. The run-time library may be BLOADED separately from the rest of your object code as a means of conserving disk space—\$99.95. At your local dealer or On-Line Systems, 36575 Mudge Ranch Road, Coarsegold, CA 93614 (209) 683-6858.

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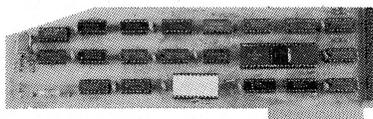
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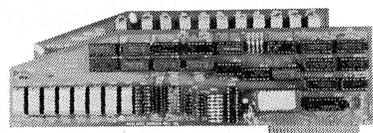
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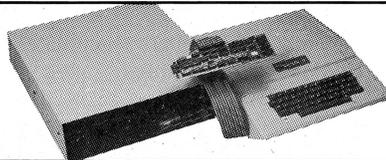
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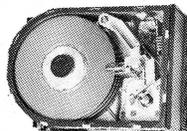
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Integer BASIC Compiler. The ultimate in speed and language power for the Apple—improvement by a factor of 10 to 20 over Apple's BASIC interpreter—15 to 30 over Applesoft! No language card necessary. Optimize code for your speed/space requirements. Object code and run-time system are completely relocatable—use memory the way you want to. Includes many powerful BASIC extensions: Full string length of 32767, CHR\$, GET and KEY functions, Direct Hi-Res graphics support, HOME, INVERT, NORMAL, FLASH, and more! Requires Apple II (or Plus with Integer or Language Card), 48K and DOS 3.3. \$149.50. Galfo Systems, 6252 Camino Verde, San Jose, CA 95119.

SIMULATIONS/GAMES

A Day at the Races. Derby is a Hi-resolution simulation of thoroughbred horse racing. Up to nine players per game, Pari-Mutuel style betting. Bet Daily Doubles, Quinellas, Perfectas, Trifectas, Win, Place, Show or combinations. Handicaps like real racing. Simulated Mutuel Pay-offs. Eight thoroughbreds per race—\$24.95 disk, \$21.95 tape. Requires 48K with Applesoft in ROM. BitAction, Box 10938, St. Louis, MO 63135.

Trick Shot Pool. TRICK SHOT is a successor to POOL 1.5. It offers many new features. Some of them are: Improved fine aim; the ability to set up trick shots by placing the balls anywhere on the table; 3 new games—Snooker, Billiards, and 3-Ball; an open table mode that allows shooting with no rule enforcement; the ability to save any shot or the status of a game to disk, thus allowing resumption of the game or shot at a later date. Up to 24 shots/game may be saved per diskette. \$39.95 includes two diskettes (one with the program and the other with some example trick shots) and instruction booklet. IDSI, Inc., P.O. Box 1658, Las Cruces, NM 88004 (505) 522-7373.

Shuffleboard. Shuffleboard for the Apple II computer is a realistic simulation

of the real thing! Play the games "Tally All" or "Cutthroat" either against the computer or a friend. Requires a 48K Apple II with a disk drive. Automatic scoring and sound effects. IDSI, P.O. Box 1658, Las Cruces, NM 88004 (505) 522-7373.

A Stellar Trek. A Stellar Trek is a high resolution color version of the Star Trek game. Three different Klingon opponents and the Romulan Star Empire are pitted against the user. Many command prerogatives, including movement throughout the galaxy, use of starship weaponry, maintenance of energy reserves, repair of damage, and more. Requires 48K and Applesoft ROM—\$24.95 on disk. Rainbow Computing, 9719 Reseda Blvd., Northridge, CA 91324 (213) 349-5560.

Pinball Simulation. From BudgeCo comes one of the best simulations of a pinball game ever! Raster Blaster, written by Billy Budge, is a true simulation of a pinball machine. Up to four players at a time may play this exciting game which keeps the high score in memory. Simulation is fast and real-time with exceptionally lifelike ball and flipper movement. Complex game includes ball grippers which hold one ball while giving you an extra ball; incremental bonus; tilt control; spring tension; multiple gate bonus, etc. Simulation is so good you can even "hold" the ball with a flipper just as its mechanical counterpart permits. At your local dealer or inquire from BudgeCo., 428 Pala Avenue, Piedmont, CA 94611 (415) 658-8141.

Space Adventure. Space Adventure is a real-time space flight simulator from Sierra Software. Take the helm and enter the coordinates to a distant position. The autopilot takes control of the ship. The viewport reappears as your course automatically changes and you begin your journey. True 3-D space adds to the realism of your journey. Requires 48K and disk—\$29.95. See your local dealer or contact Sierra Software, 536 E. Sahara Avenue, Las Vegas, NV 89104.

War Games. New from Strategic Simulations, Inc. are two historical war games: (1) The Battle of Shiloh which is a brigade-level simulation of the first grand battle of the Civil War. Pits the Confederate Army against Grant's troops and Union gunboats; (2) The Battle of the Bulge (Tigers in the Snow) has Nazi tanks and infantry sweeping across the dark, frozen forests of the Ardennes against a surprised U.S. force in this division/regiment-level simulation of Hitler's last desperate attack. At your local store.

Your Chess Program. Mychess is the most advanced microcomputer chess program available for your Apple Computer. Nine levels of play for beginners

to grand masters. Winner of the Fifth West Coast Computer Faire, Highest finishing micro in the Third World Computer Chess Championship. USCF rating of 1615. Requires Z-80—in CP/M format—\$34.95. Eight-inch soft sector 48K—\$49.95. Datasoft, Inc., 19519 Business Center Drive, Northridge, CA 91324 (213) 701-5161.

SwordThrust. SwordThrust is an exciting new fantasy role-playing system designed for the Apple II. It is an integrated system of quests—the battles you fight and the gold you gather in one cave will affect you in the next. Currently consists of the Master Diskette (which includes Adventure #1 and must be used to run any other adventure) and Adventures #2 through #4. CE Software, 801 73rd Street, Des Moines, IA 50312.

Orbitron. Orbitron places you in the center of an orbiting space station protected by a revolving force shield. The object is to fight off enemy forces which attempt to place killer satellites in orbit around your station. The game has seven levels of play, easy-to-use keyboard control, and super-fast high-resolution color graphics and excellent sound effects—\$29.95 at your local dealer by Sirius Software, Inc.

GAMES

Scrabble by Monty. "Monty Plays the Scrabble Brand Crossword Game" is a strategy game for up to three players. A Scrabble game set is required. The game includes graphics presentations of the Monty characters, board positions and scores, and sound effects. Requires 48K with Applesoft and disk. \$34.95. Personal Software Inc., 1330 Bordeaux Drive, Sunnyvale, CA 94086 (408) 745-7841.

Cross Clues. Cross Clues is a new, original word game in which the computer umpires. Two players or teams compete. Uncover the hidden words—the best combination of skill, intellect, timing and luck wins. Cross Clues is not a conversion of an existing game. Clues coaxed from the computer help both you and your opponent. The outcome remains in doubt and excitement builds as the finish nears. 50 different word games for \$29.95. Requires 48K and Applesoft. Science Research Associates, Inc., Software Products Department, 155 North Wacker Drive, Chicago, IL 60606. (800) 621-0664.

Castle Wolfenstein. Castle Wolfenstein is an action adventure game from MUSE demanding fast thinking and quick manual response. World War II rages across Europe... the Castle Wolfenstein is occupied by the army of the Reich and converted to battle-front headquarters. You have been captured

and brought to the Castle for interrogation by the dreaded SS. From a hiding place behind the stones of the dungeon a dying cellmate produces a Mauser M-98 pistol with ten bullets and gives it to you. Your new mission: find the Nazi war plans and escape Castle Wolfenstein alive. For the Apple and Apple Plus with 48K. \$29.95. MUSE software, 330 N. Charles Street, Baltimore, MD 21201 (301) 659-7212.

UTILITIES

Disk Protection System. Protect-O-Disk software protection system provides disks which are uncopyable by all currently available copy programs. Allows the user full back-up capability. Fastest disk I/O ever developed—loads and starts an entire 48K program in less than 9 seconds. Makes a 2-drive back-up in 27 seconds. Makes 1-drive back-up with only 4 disk insertions. Boots from 13 or 16 sector PROMs. Displays a Hi-Res logo during boot. Protect-O-Disk is offered as a disk duplicating service. The cost is \$1.30 per disk not including the price of the disk itself or shipping. Minimum order 100 disks. Diversified Software Research, Inc., 5848 Crampton Ct., Rockford, IL 61111 (815) 877-1343.

Developing Pascal. Display design-and-testing in seconds: interactive (<write it, you have it>) lay-out definitions and modifications. No more WRITELN and READLN...No compile errors...No debugging...No exec errors. Define for every field your headers, alphabet and controls. Variables accessible from your program, automatic declaration generation. Forms library management: easy reuse of previously defined form elements. Anywhere-across-the-display sequence of execution enables more dynamic (<column>) lay-out or any complicated design. Fields features include all numeric (with long integers scaling factors and implied or explicit decimal point), strings and char with pattern matching, all dates, DMY, MDY, YMD). Keyed values, fill in fields, and more. Utilities easy to learn and well documented. Programs much shorter. Quickform—\$295. BUS Pascal Software c/o D.P.I., 1850 Union Street Suite 272, San Francisco, CA 94123 (415) 931-7000.

Spelling Correction. Spelling correction program "MS.SPELLER" works with Apple II UCSD Pascal editor. Dictionary contains 2,000 hard to spell words. User-created dictionary with options to add, correct, or skip a word while processing. Interactive query updating. Purchase includes Text Formatter at no charge. \$60 from Intelligent Computer Systems Corp., 722 South 24th St., Arlington, VA 22202 (703) 684-7389.

Apple-Doc. Apple-Doc in DOS 3.3 is a versatile package which consists of three powerful reference utilities; Variable Cross-Reference which creates a table of every variable and the line number on which it occurs, Line Number Cross-Reference creates a table of every program line called by a GOTO, GOSUB, etc., and all lines called from, and finally, Constant Cross-Reference creates a table of all numbers used in the program not listed by the above tables. Also included are Replace, a global replacement editor and Lister which produces a completely professional program listing. The new 30-page tutorial manual makes Apple-Doc quick and easy to use—\$34.95. Southwestern Data Systems, P.O. Box 582-C, Santee, CA 92071 (714) 562-3670.

Pascal Programming Tool. Permits modifying any data stored on disk including disk directory. Display packed array structures, searches for data by file or disk unit. Converts ASCII to HEX and HEX to Pascal Integer format. Automatic increment of word display. Prints data blocks from disk—\$59.95 on disk. Requires 64K Apple II with Language Card or 16K expansion card. Softpak Associates, 626 Venice Blvd., Marina Del Rey, CA 90291 (213) 822-1830.

Disk/Memory Utilities. The Inspector is an Apple Disk and Memory utility with many features. Repairs blown disks, reads nibbles, maps disk space, searches disks for specific characters, searches memory, edits disk sectors, outputs screen to printer. Has a user exit that permits interfacing with your own routines. Undelete deleted files or programs. Repair files that have erroneous data. Comes on an easily installed EPROM making utilities always available for instantaneous use. Completely documented. Requires Integer BASIC. See your local dealer or contact Omega Software Products, Inc., 222 S. Riverside Plaza, Chicago, IL 60606 (312) 648-1944.

Applesoft Command Editor. A.C.E. combines a large number of the most useful programming utilities into one co-resident package. Its functions include cross-referencing individual variable names, displaying current values of all variables, and information on memory and diskette status. For machine language programming there is a hexadecimal converter and all monitor commands can be executed directly from Applesoft. User definable macros allow strings to be input with a single keystroke and a powerful line editor makes editing easy and greatly reduces program development time—\$29.95. Southwestern Data Systems, P.O. Box 582-C, Santee, CA 92071 (714) 562-3670.

Memory Management. MMS II is an exciting new software program that can give you an additional 10,700 bytes of memory to program with. It removes the Apple Disk Operating System (DOS) from your Apple's memory and places it on a 16K RAM expansion board in slot 0. Compatible with Apple Language Card, Microsoft RAMCard, Prometheus MEM-1, Computer Stop CS16K, Andromeda 16K RAM Board, and all others. If you have a second 16K RAM card, MMS II will recognize it and permit loading an alternate language on the alternate card. Compatible with all DOS commands and programs that use Page 3. Not copy protected so it can be used as the "HELLO" program on the boot disk. Upgrade of MMS—\$20. MMS II—\$49.95 plus \$2 shipping. Computer Data Services, P.O. Box 696, Amherst, NH 03031 (603) 673-7375.

Disk Copier. Locksmith 4.0 is the most reliable copy program available for the Apple computer. Six utility routines are designed to make using your Apple easier. Surface analysis tests for questionable media. Disk speed assists in fine tuning your drives' speed. Includes diagrams to help you to do it yourself. Bulk erase degausses your diskettes before reusing so no stray data is left over. Quick scan checks for unreliable data and finds used and unused tracks. Nibble editor allows one to fix and edit raw disk data—useful when a disk crashes. \$99.95 from Omega MicroWare, Inc., 222 South Riverside Plaza, Chicago, IL 60606 (312) 648-1944.

Disk Transfer. Transfer, a valuable Apple III utility moves sequential text files either way between an Apple disk (DOS 3.3) and your Apple III: VisiCalc data files, word-processor files, BASIC programs as text files, and laboratory-data files. Apple III diskette and manual \$60. Mind Systems Corporation, P.O. Box 506, Northampton, MA 01061 (413) 586-6463.

Pascal Software. Link Video creates terminal independent programs, validates, filters and prompts for input, safeguards programs from user error, gives programs a professional look—\$55. Link Disk converts DOS 3.3 test/binary files to Pascal, guarantees correct readable copies, examines and changes any byte on disk with easy-to-use screen editor, prints text files selectively—\$70. Link-Sampler 1 contains Pascal techniques illustrated, 21 teaching programs, 68-page easy reading manual, games and personal finance. Data Link provides error-free mainframe communications; transmit/receive up to 4800 baud, control entire session with 1 key stroke, dial and retry automatically, send concurrently to screen, printer and disk, complete error-checking, supports

Apple-Cat II at 1200 baud—\$100. Link Index uses the fastest key retrieval system, uses sophisticated B-tree indexing method, 1 record from 25,000 in less than a second, maintains sorted order, supports duplicate keys, easy to use Pascal unit—\$150. Link Systems, 1655 26th Street, Santa Monica, CA 90404 (213) 453-1851.

WORD PROCESSING

Zardax Word Processor. Zardax permits you to enter text in free-form, inserting carriage returns only when you want definite paragraph breaks. Change margin, pagewidth and pagelength with simple commands and print up a new copy in a different format. Printing 100 copies is easy. Upper/lower case on screen through software. Inserting different specific information into each copy is easy. You can be in control of the format of your words and sentences. Standard paragraphs can be combined in different ways to make new documents. Supports a wide variety of printers—\$295 at your Apple dealer. Computer Solutions, c/o Action-Research Northwest, 11442 Marine View Drive SW, Seattle, WA 98146.

Write-On III. Write-On III is designed to be easy to learn and use. Has easy to remember commands; data can be inserted into the document as it is being printed, either from the keyboard or from Write-On's data files; margin settings can be altered with a single keystroke. Up to 99 files can be merged at the time of printing to create large documents. The program can read, edit, and print text files created by other programs. In addition, a formatted "screen draft" can be examined on the video monitor before printing a document—\$249. Rainbow Computing, Inc., 19517 Business Center Drive, Northridge, CA 91324 (213) 349-0300.

PowerText. Bat out a letter on your Apple's keyboard just as fast as you can. Forget all about format. As you go, just type in simple, short commands to identify the name and address element. . . the salutation. . . paragraphs. . . and sign-off. In seconds a perfectly formatted letter starts rolling out of your printer. PowerText knows precisely how you like your letters to look. PowerText adds its own total document format control to the Pascal editor's exquisite capabilities. Automatically tracks your footnote or bibliography numbers and handles page breaks professionally. Accommodates up to 12 columns per 132-character line—with individual line spacing for each column. Excellent manual tutorial and PowerText are available for \$199. Contact Beaman Porter, Inc., Pleasant Ridge Road, Harrison, NY 10528 (914) 967-3504.

WordStar. WordStar for the Apple is the most powerful and versatile word processing software ever developed for microcomputers. With WordStar the screen shows exactly what will get printed—including all format variables like page breaks, justification, and hyphenation. As soon as you type a change, it's on the screen. On-line menu system gives so much help that the manual is often not needed. Also available are SpellStar which will find your spelling and typing mistakes for you, MailMerge makes it easy to combine files to produce personalized form letters, SuperSort takes on the biggest sorting, merging, and selecting jobs. DataStar handles data entry, retrieval, and update with tremendous power and precision. At your local dealer or contact MicroPro International Corporation, 1299 Fourth Street, San Rafael, California 94901 (415) 457-8990.

Docuwriter /// for the Apple ///. The Docuwriter /// Text Processor has been released by the Micro Software Division of Charles Mann & Associates. Allows either 96K or 128K versions of the machine to create text file systems up to 126K. The system includes its own mailing-list management system and form letter element. The entry system features centering, special form text creation, scientific notation, footnoting, superscripting, subscripting, embedded custom strings and underlining. Edit features include block text movements, string replacement, insertion, deletion, text reformatting and text merger. Requires an Apple /// with at least 96K of RAM, the SOS package, an Apple Modem Eliminator and a compatible serial printer. \$349.95. Charles Mann & Associates, Micro Software Div., 7594 San Remo Trail, Yucca Valley, CA 92284 (714) 365-9718.

Applewriter Extended. Applewriter Extended from Brillig Systems extends the capabilities of your Applewriter word processing program. Includes special print-time module that provides special characters, control-characters for printer control, etc., overriding spaces in Fill-Justify mode, Underlining Text, Bold Faced print and sending a print file to disk. Allows creating and editing TEXT files and EXEC files and editing of Applesoft files with conversions from and to either. Provides form letter capability with merged variable data in the letter. Also includes a special program that scrolls AppleWriter files. At your local dealer or contact Brillig Systems, Inc., 10270 Fern Pool Court, Burke, VA 22015 (703) 323-1339.

Type-Righter. Type-Righter word processing software for the Apple /// features automatic justification, adjustable tabs, global search and replace and

the ability to add individual files together in any order. \$195. Imagineering Inc., Adcast Advertising, 405 S. Farwell, Suite #10, Eau Claire, WI 54701 (715) 835-8611.

Catalogs/Books

Assembly Language Newsletter. Apple Assembly Line is a newsletter dedicated to Apple Assembler Language. Tutorial articles for beginners, advanced hints and techniques which save memory and time, utility programs, ready to type in and run, super subroutines for use in your programs. Quarterly disks of all source code printed in AAL during the quarter. Subscription includes 12 issues per year—\$12. S-C Software, P.O. Box 280300, Dallas, TX 75229 (214) 324-2050.

A microcomputer **Newsletter for librarians** will be published monthly by the University of Arizona, Graduate Library School. The Small Computers in Libraries (SCIL) Newsletter will act as a clearinghouse for the sharing of information on micros in libraries, and offer some guidance to those who are new to the field, in the form of glossaries, short tutorial articles, and review of both programs and books pertinent to the subject. Initial emphasis will be on the Apple and the TRS-80 series and various CP/M systems. Each issue of the newsletter will be approximately eight pages in length. It will be an informal medium by which those working in this area can share their experiences and problems. The domestic subscription price is \$20 per year. Other North American subscriptions are \$25 and foreign subscriptions are \$35 per year. Graduate Library School, ATTN: SCIL, University of Arizona, 1515 East First Street, Tucson, AZ 85719 (602) 626-3565.

Electronic Products. This catalog contains TV and FM high pass interference filters and audio low pass filters. Also power line spike suppressors, power interrupters, hash filters and regulators. Electronic Specialists, Inc., 171 South Main Street, Natick, MA 01760 (617) 655-1532.

DOSSOURCE 3.3 for the Apple II is a source listing of DOS 3.3 disassembled and commented by Randy Hyde. It is a LISA 2.5 compatible source listing. LISA 2.5 owners can load and reassemble DOS at other locations for special applications. Remove portions of DOS that you may not need. Learn lots of 6502 programming tricks. Utilize several useful routines found within DOS such as decimal input and output. A perfect companion to Beneath Apple DOS by Quality Software. Lazer Micro System, Inc., 1791-G Capital, Corona, CA 91720 (714) 735-1041.

Computer Products. From Jade comes the 1981 catalog of computer related products. Covers hardware and software for the Apple and many other computers. Full line of cables, A to D converters, chassis, connectors, plotters, diskettes, EPROMS, sockets, switches, nibbling tool, tools, etc., etc. 4901 West Rosecrans Avenue, Hawthorne, CA 90250. (800) 421-5500 or in CA (800) 262-1710.

VisiCalc Newsletter. Software Arts Technical Notes (SATN), from the creators of VisiCalc, is filled with techniques and information to help you expand your present understanding of VisiCalc functions as well as learn advanced methods to help in developing your own VisiCalc applications. 6 issues per year—\$30. Software Arts, Inc., P.O. Box 815, Quincy, MA 02169 (800) 257-7850—in New Jersey call (800) 322-8650.

Languages. Apple Pascal by Arthur Luehrmann and Herbert Peckham, gives you everything you need to use the most powerful language your computer can have. User-tested, step-by-step approach features hands-on experiences in creating, running, and debugging programs. Spiral bound to lie flat as it takes you from basics to advanced programming and graphics applications—\$14.95 from McGraw-Hill Book Company, P.O. Box 400, Highstown, NJ 08520.

Apple II User's Guide. This book—truly a user's guide—guides you step by step through nearly every aspect of using your Apple II. Includes: Presenting the Apple II, How to Operate the Apple II, Programming in BASIC, Advanced BASIC programming, The Disk II, Graphics and Sound, Machine Language Monitor, and a compendium of BASIC statements and functions. Twelve appendices provide quick-reference material on functions, editing, errors, PEEKs and POKEs, memory usage, etc., 385 pages, paperback list \$15. At your local dealer or contact Osborne/McGraw-Hill Publishers.

Disk Operating System. Beneath Apple DOS is a technical manual containing eight chapters, three appendices, a glossary, an index and over 160 pages. This manual will serve to completely fill in the many gaps left by Apple's DOS 3.3 manual. Has a large quantity of excellent diagrams and tables, source listings of useful disk utilities, a glossary of over 150 technical terms, an exhaustive description of DOS program logic and all entry points, a reference card and many programming examples—\$19.95 at your local dealer or contact Quality Software, 6660 Reseda Blvd., Suite 105, Reseda, CA 91335 (213) 344-6599.

"What's where in the Apple?" is the most complete listing of Apple II firm-ware and hardware ever published. Guides you with a numerical Atlas and an alphabetical Gazetteer to over 2,000 memory locations of PEEKs, POKEs, and CALLs. Gives names and locations of various Monitor, DOS, Integer and Applesoft BASIC routines and tells you what they're used for—\$14.95 at your local dealer or contact Micro Ink, Inc., 34 Chelmsford Street, P.O. Box 6502, Chelmsford, MA 01824.

Programmer's Handbook. Programmers handbook for the Apple is an indexed looseleaf notebook (7½"×9") containing all the reference material found in their Programmers Guide to the Apple II. Covers Applesoft and Integer, CP/M Digital Research, Inc., BASIC—80 Microsoft, Pascal, 6502 Assembly language, DOS 3.3, DOS Tool Kit, Monitor. Includes command references for Applewriter, VisiCalc, Macro-Sced. Hardware configurations & software commands for Spinwriter, Paper Tiger, Silentye, Special ROMs \$29.95. Computer Station, 11610 Page Service Drive, St. Louis, MO 63141 (314) 432-7019.

Directory of Software. Over 2,000 software products—detailed descriptions including data on vendor, system requirements, pricing, maintenance, documentation, training, etc. Also includes over 1,000 software vendor profiles including product line, applications, emphasis, and sales volume. Four major indices—applications index, product name index, vendor/product name index, computer system index. Your subscription includes two loose-leaf volumes, 12 monthly supplements (up to 100 pages each), 12 monthly newsletters, and Datapro's popular Telephone Inquiry Service—\$340. Datapro Research Corporation, 1805 Underwood Boulevard, Delran, NJ 08075 (609) 764-0100.

CP/M Systems. The CP/M Operating System has already become the most widely used operating system for microcomputers. A new paperback from dilithium Press will ease the reader into the essentials of CP/M (Control Programs for Microcomputers). How to Get Started with CP/M by Carl Townsend was written in a form that can be read and understood by someone totally unfamiliar with computers. Includes a glossary, a handy guide on shopping for an operating system, a list of hardware manufacturers supporting CP/M, a list of major CP/M software, a CP/M Memory Map, CP/M compatible programming languages, and CP/M diagnostics—\$9.95. Contact dilithium Press, 11000 S.W. 11th Street, Suite E, Beaverton, OR 97005 (503) 646-2713.

School Software Directory. Two new publications available from School Microware Publications will enable you to choose the right software for your needs. The Directory provides easy access to comprehensive information about educational software for the Apple, Atari, Pet and TRS-80 microcomputers. The Reviews provides in-depth user evaluation of instructional software for the same machines. The Directory currently includes over 900 products, twice as many as any other source. Hitting all grade levels K-12, it covers more than 50 subjects from Arithmetic through Typing. Each edition of Reviews contains evaluations of over 50 products. Moreover, it includes an index to scores of evaluations in other publications. Subscription to the Directory (2 issues per year)—\$25, 2 years—\$45, 3 years—\$67. Reviews \$20 per issue. Both for \$52 per year (two each). Dresden Associates, P.O. Box 246, Dresden, ME 04342 (207) 737-4466.

Software Newsletter. Micro Co-op is a software co-operative. They publish a bi-monthly newsletter describing various new and useful software products as they become available, and try to give reasonable comparisons of existing products that help you make more educated buying decisions. Members may purchase most software through us below retail price. For more information, write for a free copy of the newsletter. Micro Co-op (specify Apple or Atari) Newsletter, P.O. Box 432, West Chicago, IL 60185 (312) 231-0912.

Miscellaneous

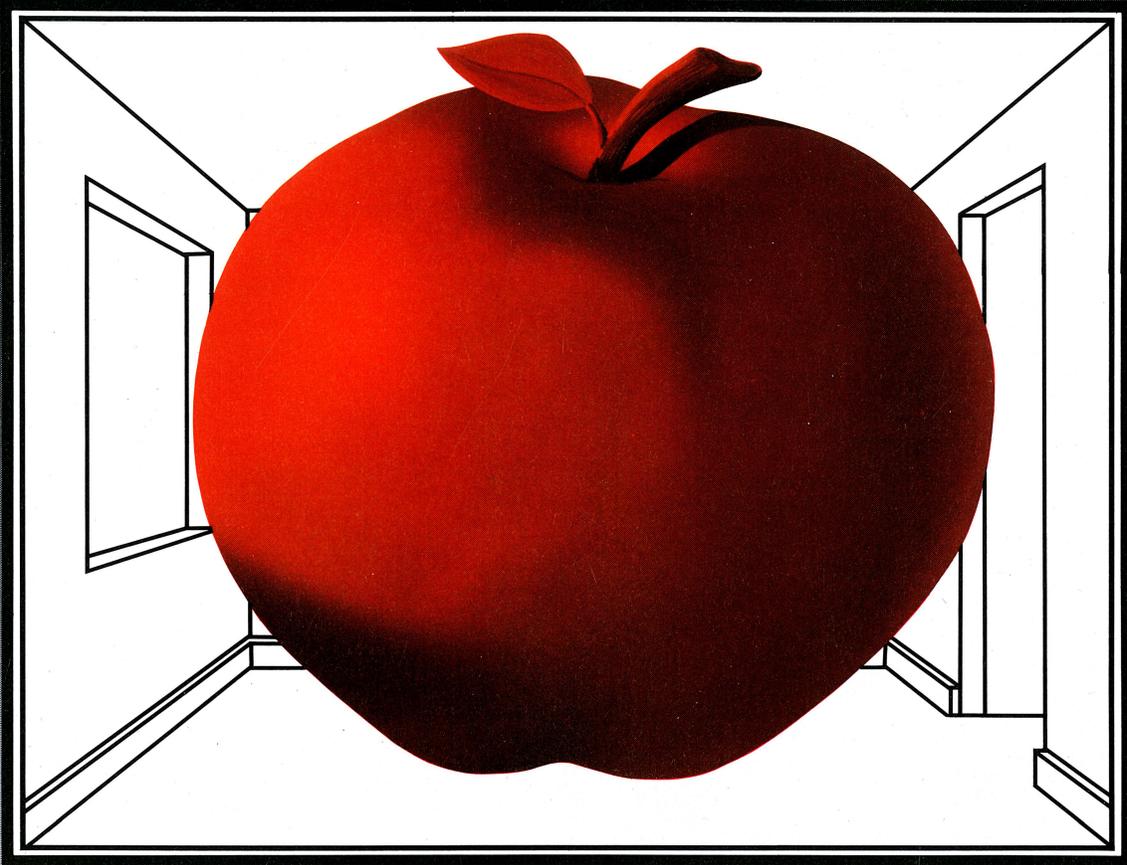
Maximum Security Lock. Anchor Pads lock your computer or equipment securely to a desk or counter. Requires no holes or sawing and no marring of furniture. Anchor Pad of Northern California, 9046 Lindblade Street, Culver City, CA 90230 (213) 559-7111.

Rosewood Keyboard Inserts. Genuine rosewood keyboard inserts for the left, right and lower portions of the Apple's keyboard are available for you to install yourself. Easy to do and fast. \$9.95 plus \$1.50 shipping. DataSmith, P.O. Box 834, Pacific Grove, CA 93950.

Computer Case. New from Fiberbilt are cases for the Apple II and the Epson MX-80 printer. Available in either aluminum or polyplex case. Apple II with single or double disk drives, diskettes and P/C boards—\$173.75 (alum), \$112.50 (poly). Bell & Howell Apple II computer with single or double disk drives, diskettes, and P/C boards \$183.75 (alum), \$122.50 (poly). Epson MX-80—\$128.25 (alum), \$85.75 (poly). Contact Fiberbilt, 601 West 26th Street, New York, NY 10001 (212) 675-5820.



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434

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- Dam Identity
- Date of Birth
- Type Classification
- Lactation Number
- Current Status Code
- Date Calved (4 lactations)
- Calf I.D., Sex, and Sire (4 lactations)
- Date Last Bred & Bull
- Date Previously Bred & Bull
- Times Bred this lactation
- Date of Pregnancy Check
- Pregnant or Open
- Date to Dry (or Date Dried)
- Date Due
- # of days since calving
- # of days not bred this lactation
- # of days open this lactation
- 3 User defined status codes
- Date of Last Test
- Pounds of Milk
- % Change Since Last Test
- % Butterfat
- 3 User Defined Milk Quality Codes
- Total Lactation Milk & BF (4 lactations)
- Adj. 305 day Milk & BF (4 lactations)
- Average % Butterfat (4 lactations)
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- Average Daily Production for each month of last 2 lactations

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- Cows due to calve
- Cows last bred 18-22 days ago
- Open cows
- Cows due for pregnancy check
- Cows due to dry off
- Cows due to begin lead feed

In addition, a flexible reporting system allows the user to format his own reports on herd status. Reports can include all cows that meet conditions set by the user or can be sorted any one item. For example, a report may include all cows that are not yet pregnant, sorted by cow #. Or it may include all cows in group #2 that have not been bred and calved more than 90 days ago. Or perhaps all cows in milk less than 100 days with greater than 10% drop in milk production since the last test and with status code equal to 3. The combinations are almost unlimited. All of this is available immediately - when and if you want it, without waiting for the mailman.

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FARMPLAN'S PIG PACKAGE

Individual sow records contain:

- Sow number
- Current status (*bred, open, etc.*)
- Number of litters
- Times bred
- Latest boar
- 10 litter records (*date farrowed, #born, #alive, birth weight, date weaned, #weaned, wean wt., average litter size & weight*)

Individual boar records contain:

- Boar number (*or 4 letter name*)
- Total breedings
- Positive breedings
- Negative breedings
- Total pigs born
- Total weight of births
- Average litter size & weight

Herdsman's action lists:

- Sows due for weaning
- Sows not bred
- Possible open sows
- Sows due for pregnancy check
- Sows due to farrow (*listed for each of the next 16 weeks*)

THE HERD REPORT:

Gives number of filts, sows bred, pregnant, open, lactating, and weaned in the herd, as well as total females, total boars, females/boars ratio, total sucklers, and total weaners.

SUMMARY OF WEEK'S ACTIVITIES:

Shows number of sows bred, farrowed, weaned, and culled and number of pigs born, weaned and died over the previous week.

HERD LITTER PROFILE:

Shows the number of sows in each litter category. That is, how many sows have had no litters, how many have had one litter, etc. up to 10 litters per sow.

BOAR REPORT:

Displays for each boar in the herd the number of litters sired, conception rate, and average litter size and weight. Also shows number of breedings this week, over the last 4 to 8 weeks, and the 4 to 8 week conception rate.

HERD STATISTICS:

Herd performance can be accurately monitored by this report. Shown are number of sows bred per week, breeding success rate, number of sows farrowed per week, average number born per litter, number of deaths, number weaned per litter, and percentage of small litters.

Sow performance is shown by breedings per sow per year, farrowings per sow per year, farrowing interval, feed intake, deaths, average litter size, average litter weight, feed efficiency, and cost efficiency.

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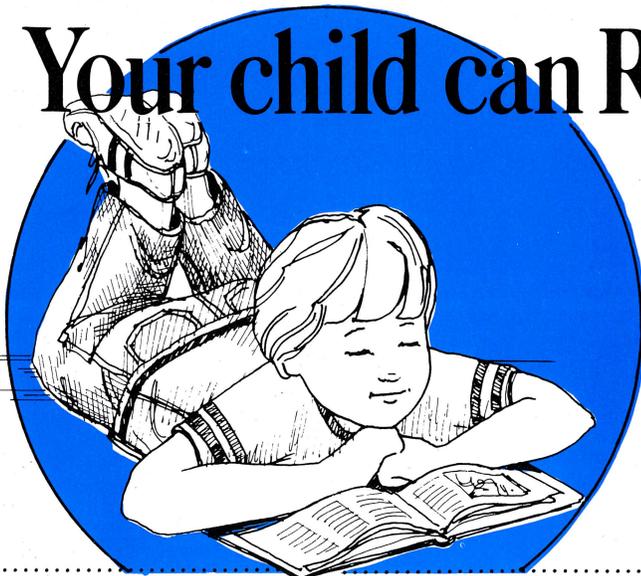
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	PAGE		PAGE
Advanced Business Technology, Inc.	51	Mountain Computer Inc.	BC
Advanced Computer Products	49	MUSE Software	20, 80
Advanced Logic Systems	89	Nibble	45
American Software Publishing	94	No Name Software	60
ARTSCI Inc.	43	OMEGA MicroWare, Inc.	60, 62, 68
Avant-Garde Creations	70	Orange Micro Inc.	37
Beagle Bros.	82	Personal Software Inc.	44
BK Technologies, Inc.	80	Prometheus Products Inc.	69
Broderbund Software	8	Quad Systems	41
Cases, Inc.	8	Saturn Systems, Inc.	47
Ceco, Inc.	75	Software Publishing Corporation	IBC
Computer Case Company	51	Software Technology for Computers	76
Computer Micro Works, Inc.	20	Sorrento Valley Associates	84
Computer Station	82	Southwestern Data Systems	57
Creative Computing Software	13	Spectrum Software	23
Creative Micro Systems	64	SSM Microcomputer Products	25, 27
DR Jarvis Computing Inc.	59	Stretegic Simulations	71
Data Shift, Inc.	62	Street Electronics Corporation	20
Datamost	48, 59, 72, 96	Synergistic Software	1
dilithium Press	11	The Source	17
FMJ, Inc.	33	Trace Systems, Inc.	5
Farmplan Computer Systems Inc.	90-93	USE Inc.	94
Hutton Industries, Inc.	73	Used Computer Exchange	59
M & R Enterprises	IFC	Verbatim	28
MicroMotion	82	Videx	29
Microsoft	7, 26	Votrax	2
Micro-Ware Distributing Inc.	51		



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(continued from page 33)

Paul supplies some of his own answers by saying "We are considering special 'cleaned up' discs of software, advertising in our newsletter, higher membership fees, more aggressive hardware sales, etc."

Almost since its inception, the San Francisco Apple Core has sold to its members a Disk of the Month (DOM) for \$5.00 at the meeting and \$7.50 via mail order. The DOM are member-developed programs and software swaps with other clubs. No (repeat NO) commercial software is ever included. Since the Core is able to obtain diskettes in quantity for between \$2-3.00, each sale of a DOM contributes to the treasury. At the

end of the year, our hard-working Club Librarian organizes the DOM's into a Library with related software grouped together (Utilities, Text Games, Education, etc.) A Core 3-ring binder along with the Library Documentation—an annotated "catalog"—completes the package which we sell for \$150.00! With about 300 programs per year, the prospective purchaser can be told that the effective cost is \$0.50 per program! Again, the economics add to the treasury.

The Apple Core has not engaged in aggressive hardware sales for two basic reasons: 1) the Buyer's Group never become very active, and 2) we didn't want to turn off the support of

the computer stores. However, if you decide hardware sales are in your club's financial interest, you should avoid carrying the inventory since it can require laying out cash early for purchases made later. This can create cash flow problems. Talk with manufacturers and distributors to see what kinds of "deals" can be worked out.

An Important TIP from Randy:

A club, whether it has 5, 50, 500 or 5000 members, is a business and should be run in a business-like way. This means that you should maintain a good set of accounting books which reflect the operations of your club. Most clubs have accountants as members, and they should be asked to volunteer to either keep the books or assist someone. Each of the club's activities should be identified and accounted for functionally. For example, membership costs include the costs of membership forms, postage for renewals (start the renewal process 3 months before expiration), costs for posters and other forms of advertising for members, meeting location expenses, etc. Since the membership revenue is the membership fee times the number of members, the profitability of each member can be found by subtracting the total membership costs from the membership revenue and dividing by the number of members. If this figure is too low, raise the dues or look for other profitable services.

If you are a small club, use VisiCalc or a small general ledger program to keep track of revenues and expenses. As you grow, increase the power of your accounting system (you can change each year if necessary). Finally, your Treasurer should present an accounting to your Board or Executive Committee at each executive session.

QUESTION:

How do we get club questions answered?

ANSWER:

Write me at the IAC address, or call me at 415/775-7965.

TIP:

Phone calls almost always get an answer. Letters almost always pile up in the "IN" basket, but invariably will be answered in the USER GROUP FORUM. And, if your club doesn't have a copy of "INIT" USER GROUP" manual, let us know.

"THIEF"
"The damn things nearly killed me."

It seemed like a cinch assignment. At least for the galaxy's master thief.

Just sneak inside the Star-Complex Base, dodge a few guardian robots and grab the formula. A piece of cake.

Oh yeah! They didn't say the robots went berserk at the sight of a human. They didn't say I'd have to laser my way through 7 levels. Or, that rampaging robots would keep coming and coming.

And most of all, they didn't bother to say there's some weird blob, an unearthly something that tracks you right thru the damn walls.

I made it to the 7th level. I found the formula. But, more robots are massing out there. And I'm wounded. My energy charge is low.

You. Yes, you. How good a Thief are you? Prove yourself. Come get me. Come save me.

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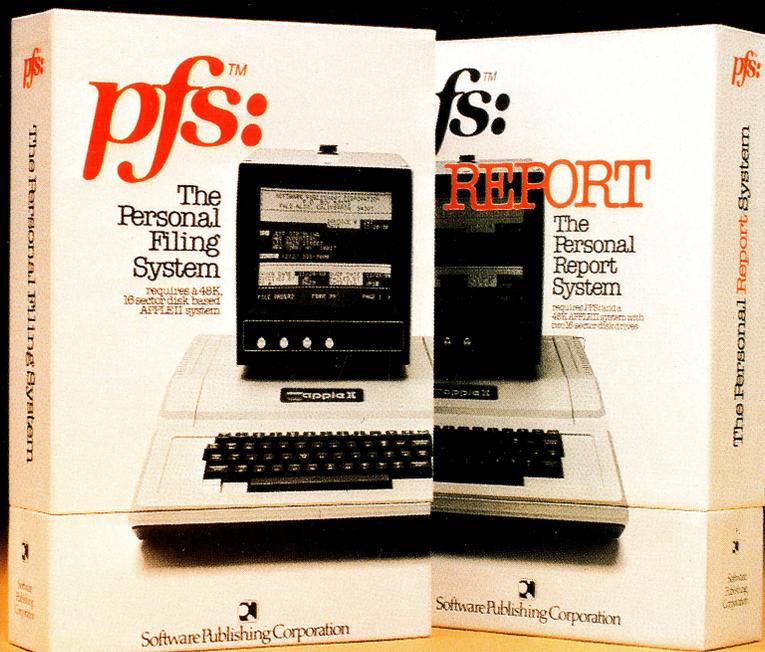
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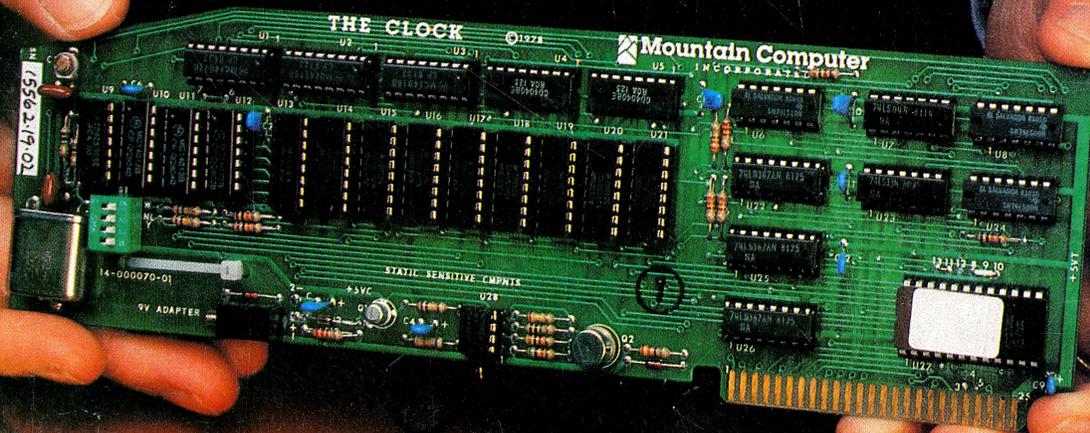


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